REPORT DOCUMENTATION PAGE	*Form Approved* *OMB No. 0704-0188*

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1. REPORT DATE *(DD-MM-YYYY)* 12-10-2010	2. REPORT TYPE Annual / Final	3. DATES COVERED *(From - To)* July 1, 2009 – June 30, 2010

4. TITLE AND SUBTITLE Integrated Information Technology Policy Analysis Research Annual / Final Report Task 1 of Cooperative Agreement W911NF-08-2-0049 between Foundation for California State University, San Bernardino & U.S. Army Research Laboratory	5a. CONTRACT NUMBER W911NF-08-2-0049
	5b. GRANT NUMBER
	5c. PROGRAM ELEMENT NUMBER

6. AUTHOR(S) Young, Clifford, O, Sr., D.P.A.	5d. PROJECT NUMBER
	5e. TASK NUMBER 1
	5f. WORK UNIT NUMBER

7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) The Foundation for California State University, San Bernardino Integrated Information Technology Policy Analysis Research 5500 University Parkway, San Bernardino, CA 92407	8. PERFORMING ORGANIZATION REPORT NUMBER

9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES) U.S. Army Research Laboratory Attn: Mr. Mark A. Thomas, ARL Cooperative Agreement Manager Building 321, Room 1B Aberdeen Proving Ground, MD 21005	10. SPONSOR/MONITOR'S ACRONYM(S) ARL
	11. SPONSOR/MONITOR'S REPORT NUMBER(S)

12. DISTRIBUTION/AVAILABILITY STATEMENT

DISTRIBUTION STATEMENT A. Approved for public release; distribution is unlimited.

13. SUPPLEMENTARY NOTES

14. ABSTRACT

The Integrated Information Technology Policy Analysis Research (IITPAR) assists the US Army through the US Army Research Laboratory (ARL) in identifying and breaking down legislative and bureaucratic barriers to the use of information technology on the battlefield. Putting the right technology into the right hands at the right time will save the lives of soldiers in combat. The Principal Investigator, Dr. Clifford O. Young, directs a team of policy experts at California State University, San Bernardino and collaborates with leading research scientists at the ARL, Network Science Center at the United States Military Academy at West Point, and the Institute for Human and Machine Cognition in Pensacola, Florida. This collaborative effort is advancing the US Army's transformation to Network Centric Operations/Network Centric Warfare through IITPAR. The objective is to translate an information advantage into a competitive warfighting advantage through the robust networking of well-informed geographically dispersed forces.

15. SUBJECT TERMS

Information sharing, technology advancement, public policy

16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT	18. NUMBER OF PAGES	19a. NAME OF RESPONSIBLE PERSON Clifford O. Young, Sr., D.P.A.
a. REPORT	b. ABSTRACT	c. THIS PAGE	UU	110	19b. TELEPHONE NUMBER *(Include area code)* (909) 537-5717
Unclassified	Unclassified	Unclassified			

Standard Form 298 (Rev. 8/98)
Prescribed by ANSI Std. Z39.18

[Annual / Final Report]

Task 1 of Cooperative Agreement W911NF-08-2-0049 between
Foundation for California State University, San Bernardino &
U.S. Army Research Laboratory

Presented to

Mark A. Thomas, ARL Cooperative Agreement Manager

Submitted by

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Introduction

The Integrated Information Technology Policy Analysis Research (IITPAR) combines cognitive science, information science, and computer science research with an analysis of public policy and legislative policy to advance United States Army network centric operations today and tomorrow. IITPAR assists the US Army through the US Army Research Laboratory (ARL) in identifying and breaking down legislative and bureaucratic barriers to the use of information technology on the battlefield. Putting the right technology into the right hands at the right time will save the lives of soldiers in combat.

The Principal Investigator, Dr. Clifford O. Young, directs a team of policy experts at California State University, San Bernardino (CSUSB) and collaborates with leading research scientists at the ARL, Network Science Center (NSC) at the United States Military Academy (USMA) at West Point, and the Institute for Human and Machine Cognition (IHMC) in Pensacola, Florida. This collaborative effort is advancing the US Army's transformation to Network Centric Operations (NCO) / Network Centric Warfare (NCW) through IITPAR. The objective is to translate an information advantage into a competitive warfighting advantage through the robust networking of well-informed geographically dispersed forces.

Task 1: *Problem Definition and Detailed Plan*

We continue to update the problem definition as the project proceeds. There is a need to address those public policy and technology barriers to better enable the soldier in the field to do her or his job. We are constantly defining the difference between "Big P" and "little p" policies for the technology stakeholder group.

During the first quarter, a detailed plan outlining the collaboration between the Network Science Center (NSC), United States Military Academy, West Point and Integrated Information Technology Policy Analysis Research (IITPAR), California State University, San Bernardino was proposed. In it, the many areas where IITPAR and the NSC can work together are summarized. See **Appendix 1** for the proposal.

Research undertaken during the second quarter, combined with meetings involving IITPAR, Communications-Electronics Research, Development, and Engineering Center (CERDEC) and the NSC at West Point, greatly advanced IITPAR's understanding of the problems and issues surrounding Army efforts to develop and field policy-aware, semantic web technologies. As a result, great strides were made in the development of research designs that will support United States policy efforts in both counter-insurgency (COIN) and nation building.

Also during the second quarter, IITPAR began working closely with researchers at West Point's Network Science Center in the development of technology related to Unclassified Tactical Ground Reporting (TiGR-U) system. Since TiGR-U is an unclassified version of the Tactical Ground Reporting (TiGR) information sharing system, it has become one system available to IITPAR in its work to identify and overcome barriers to information sharing. Thus, IITPAR is involved in the development of projects that are using TiGR-U to test technologies that will link TiGR-U to other information sharing networks.

The main project involving work with TiGR-U is the Coalition Warfare Project (CWP). IITPAR has become a key participant in this project. The CWP is working to identify and overcome barriers to information sharing among coalition partners by using TiGR-U as a test bed for new technologies and for new policies for information sharing among coalition partners. Also participating in the project are researchers within West Point's Network Science Center. The CWP team traveled to France and met with the American Embassy in Paris and four universities/institutes throughout the country where IITPAR presented a project overview. For a copy of the overview that was presented to the French, please see **Appendix 2**. One member of the CWP team is scheduled to work in France next summer as part of research efforts to link technologies for information sharing. Additional discussions are ongoing with British counterparts regarding United Kingdom participation in the project.

An initial part of the CWP project is a survey being undertaken in Afghanistan to gather data on the political, economic, social, and infrastructure situation in Afghanistan with the goal of using the data to assist in nation-building efforts. IITPAR has contributed in the development of survey questions and will assist in the analysis of the data gathered. The survey work will be conducted by cadets at the National Military Academy in Afghanistan (NMAA) during their semester break and is being overseen by Dr. John James of the Network Science Center. The survey is also providing an opportunity to test new technologies added to TiGR-U for the purpose of gathering political, military, economic, social, infrastructure and information (PMESII) data and humanitarian assistance/disaster relief (HADR) data. For an update on the status of this portion of the project, please see an email sent from Dr. John James to Dr. Clifford Young in **Appendix 3**.

Expansion of the CWP to include case studies at the district and/or province level in Afghanistan is in the early stages of development. These case studies would seek to address policy areas that are of concern to U.S. policymakers:
- Filling current gaps in PMESII and HADR data.
- Developing the technology or process that will allow information to flow among the many different groups -- military, government, NGOs, etc.

Through cooperative work with researchers at the Network Science Center (NSC) at West Point, meetings and discussions were held with a number of military

personnel and civilian government personnel with experience in counter-insurgency (COIN) and reconstruction missions in Afghanistan and Iraq. In addition, research was undertaken by the joint IITPAR and NSC team involved in the CWP regarding U.S. military policy in Afghanistan and Iraq. This research has involved the collection of policy papers circulated within the military command structure.

The meetings and discussions with personnel operating in theater and research related to military policy has shed much light on the problems related to information gathering, analysis and sharing that are faced by the United States and coalition soldiers operating in theater. As a result, the CWP developed a three-year research plan and statement of work that seeks to address the information problems identified in the second quarter.

In the third quarter, researchers within the CWP began the process of modifying the Tactical Ground Reporting (TiGR) based technology is for the collection of survey information related to collection of political, military, economic, social, infrastructure and information (PMESII) and humanitarian assistance/disaster relief (HADR) data to assist in reconstruction missions. In addition, work was advanced in the development of a search engine that would work with the TiGR-U system. Further modifications and advances in the development of the search engine and TiGR-U interface were worked on in the fourth quarter.

Task 2: *Policy Workshops with Proceedings and Policy Working Group Quarterly Meetings with Experts in Public Policy and Technology as They Relate to Communications and Battle Space Issues*

During the first quarter, the Integrated Information Technology Policy Analysis Research (IITPAR) team visited Fort Huachuca, Arizona to attend a technology briefing on July 23 - 25, 2009.

Initial discussions were undertaken August 4, 2009 at West Point with staff of the Network Science Center (NSC) to begin the process of developing a collaborative relationship that will both further the work of IITPAR and that will provide educational and research opportunities for students and faculty at California State University, San Bernardino (CSUSB) and for cadets and faculty at the USMA. This involved research aimed at understanding the projects being undertaken at West Point that relate to information sharing and particularly use of the Tactical Ground Reporting (TiGR) system. IITPAR has been engaged in efforts to assist in the development of information sharing technology that would improve situational awareness on the battlefield. This work involves both the development of technology and research aimed at identifying and eliminating policy barriers that would hinder deployment of that technology. The work undertaken during this

period moved IITPAR closer to that goal. For a summary of the discussion, please see **Appendix 4**.

Progress was made to solidify a collaborative relationship between IITPAR and the NSC that advanced both the mission of the Center and IITPAR. This collaborative process involved several days of meetings held at West Point from September 2 - 4, 2009. For the minutes of the meeting, please see **Appendix 5**.

IITPAR's Policy Working Group held a quarterly meeting during the TiGR Users and Network Science workshops. The workshops were held at West Point from October 27 through October 30, 2009.

A meeting was also held on November 20, 2009 at the USMA at West Point involving IITPAR, CERDEC and West Point. The purpose of the meeting was to update on parties and move forward plans for the Coalition Warfare Project, the April 2010 workshop and to discuss future collaborative projects between IITPAR and West Point's Network Science Center. Please see the agenda for the November 20, 2009 meeting in **Appendix 6**.

IITPAR took the lead in developing and organizing a workshop being held April 6 - 9, 2010 in Indian Wells, California that brought together academics, military researchers and soldiers from the battlefield to discuss the information needs and challenges of soldiers operating on the frontlines. The workshop "Information Sharing at the Front Line: Critical Perspectives on Soldiers as Gatherers, Analyzers, and Users of Situational Information" was hosted by IITPAR at CSUSB in collaboration with the Network Science Center at United States Military Academy at West Point. The workshop, focused on the critical aspects regarding policy and technology barriers related to the collection and flow of information, featured scheduled presentations by a variety of experts in the field. The workshop was attended by some members of the United States Congress, United States military soldiers returning from the battlefields of Iraq and Afghanistan, West Point cadets, Integrated Technology Transfer Network (ITTN) Fellows from CSUSB, academics, policy analysts, scientists, and faculty. For the executive summary of the workshop proceedings, please see **Appendix 7**.

From April 24, 2010 through April 29, 2010, Dr. Clifford Young and IITPAR staff attended follow up meetings to the Indian Wells workshop with the Network Science Center, West Point, NY. They met with Dr. John James to finalize the timeline, objectives and logistics for the Afghanistan surveys. They also met with LTC John Graham, Ph.D. and Ms. Tish Torgerson to discuss the priorities of the working relationship between CSUSB and United States Military Academy at West Point. These priorities included the US soldier survey, relationship with CERDEC, future publications, and getting West Point graduates into a master's program at CSUSB.

From May 9, 2010 through May 15, 2010, Dr. Young attended meetings at the Network Science Center in West Point, NY and the Federal Technology Policy conference in Washington, DC.

From June 19, 2010 through June 24, 2010, Dr. Young attended a follow-up meeting with the Senior Policy Analyst in the Office of Science and Technology Policy at the Executive Office of the President and Department of Education (White House, Washington, DC).

Task 3: *Research Conference Participation*

During the first quarter, IITPAR and members of the Policy Working Group (PWG) played an active role in providing support for an October 27 - 28, 2009 Tactical Ground Reporting (TiGR) User's conference at the United States Military Academy (USMA) at West Point. Also in this period, PWG members continued efforts to develop joint proposals with United Kingdom partners for research into methods for overcoming both technological and policy barriers to information sharing among coalition partners.

In the second quarter, Dr. Clifford Young presented at the International Academy of Business and Public Administration Disciplines conference in Memphis, Tennessee from October 22 through 25, 2009. The title of the IITPAR work is "A Model for Addressing Policy Barriers for Military Information-Sharing Technology." See **Appendix 8** for the abstract.

Additional work in the second quarter included participation by the IITPAR PWG in two important workshops. They were the Fourth Annual Network Science Workshop and the first Annual TiGR Users Workshop, both held October 27 - 30 at West Point. The Network Science portion of the event brought together researchers – both within and outside of the military – from such disciplines as physics, chemistry, biology, computer science and technology and from multiple social science fields in order to combine efforts to better understand multiple network systems, including technical, biological and social networks.

Featured speaker for the TiGR Users Conference was Vice Chief of Staff of the Army Gen. Peter Chiarelli. The workshops also provided the IITPAR PWG the opportunity to interact with soldiers fresh from the battlefield who gave IITPAR much insight into the intelligence-gathering situation on the ground. Maxie McFarland also provided IITPAR with a glimpse of the potential future needs of the military during a luncheon speech. McFarland is G2 with the US Army Training and Doctrine Command (TRADOC).

The workshops gave members of the PWG the opportunity to interact with more than 100 top military researchers from throughout the US and abroad. Through those networking opportunities, IITPAR not only gathered much information that is helping to advance its work, but also made itself known to a wide array of researchers and military officers. Additionally, the IITPAR PWG also held its quarterly meeting during the conferences at West Point.

Task 4: *Research and Publications*

Development of a joint research project involving a survey of cadets at the National Military Academy of Afghanistan (NMAA) was begun during the first quarter. A follow-up meeting at West Point was held on September 16, 2009 to advance this project. The survey project moves forward IITPAR's work in assisting in the development and deployment of information sharing technology. IITPAR has identified the unclassified TiGR-U system, used by the USMA at West Point as part of cadet training, as a technology that is of tremendous value at the battlefield level. IITPAR began to solidify its agreement with the USMA at West Point for a collaborative effort to develop technology that allows for an expanded use of TiGR-U for nation-building and humanitarian assistance. The proposed Afghan survey is part of this process. Development of surveys of Army missions is related to HADR and reconstruction efforts in Afghanistan. For more information on the research project, see the document titled "Summary Research Design Coalition-Information Sharing using TiGR-U" in **Appendix 9**.

IITPAR submitted work that was accepted for participation in the October 22-25, 2009 conference in Memphis, Tennessee of the International Academy of Business and Public Administration Disciplines. The title of the work is "A Model for Addressing Policy Barriers for Military Information Sharing Technology." See **Appendix 8** for the abstract.

During the third quarter, the CWP developed its plan for a test survey that will take place in August 2010 using cadets from the National Military Academy of Afghanistan (NMAA). Dr. John James with NSC acquired the funding in this quarter for travel to Afghanistan in the summer of 2010 and for the purchase of necessary equipment for the test survey. Four NMAA cadets will work with Provincial Reconstruction Teams (PRTs) in their home areas during the August break at NMAA. Using the interface developed by CWP researchers, these cadets will use a TiGR-based system and Android phones to collect data to be used in HADR and reconstruction missions. The results of this data will be analyzed in the fall of 2010 and will be used to guide the development of a broader survey team that will be fielded in August 2011.

In addition, during the third quarter, a survey was developed and fielded to members of three Army Agri-business Development Teams (ADTs) involved in reconstruction work in Afghanistan. The survey was fielded at the end of this quarter and the results would be gathered and analyzed during the fourth quarter. Initial survey results provide researchers with information regarding the technologies being used by soldiers engaged in reconstruction efforts, on the information needed by soldiers for success in their missions and on the barriers, both technological and policy, the soldiers face in using current technologies for their reconstruction missions. Please refer to **Appendix 10** for the document titled "Coalition Warfare Project: Developing Information Management for a COIN Strategy" for more discussion on this topic and a copy of the survey.

Advances were also made in the third quarter in the development of a project involving interviews of military personnel returning from theater who were members of PRTs. These interviews would be conducted at Ft. Benning, Georgia during debriefing periods of returning teams.

During the third quarter, a white paper was developed that addresses the role of IITPAR based on new directions in military policy in theater. Research was undertaken of policy doctrine circulated by military commanders regarding policy and strategy related to the wars in Iraq and Afghanistan. These doctrinal papers address gaps in information needs from frontline soldiers. Based on this research, an assessment was made of the capacity of IITPAR to play a role in filling these information gaps that had been identified by military commanders. Please see **Appendix 11** for a draft of the white paper.

A survey aimed at helping to identify the information needs of soldiers engaged in reconstruction efforts in Afghanistan was fielded in March 2010. Initial results of the survey provided feedback to researchers involved in the CWP project. In addition, direct contact with commanders of ADTs being surveyed made it possible for researchers involved in the CWP to directly query commanders in Afghanistan regarding their information needs and perspectives on current technologies being used for reconstruction missions.

In the fourth quarter, the IITPAR team finalized three surveys: the US Soldier Survey, the National Military Academy of Afghanistan (NMAA) Faculty, Staff and Cadet Survey, and the Afghanistan PRTs Survey. All three surveys were written in collaboration with the Institute of Applied Research and Policy Analysis (IAR) at California State University, San Bernardino (CSUSB).

The United States Soldier Survey was finalized and made ready for implementation. This survey assesses current methods/systems of information sharing and the variety of barriers to sharing information experienced in the field. The survey also obtains the soldier's views on how to improve these systems and gives insight into what type of technology may be needed. Contacts were made and trips were

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planned to collect data from soldiers returning from overseas deployment at the Continental United States (CONUS) Replacement Center (CRC) at Fort Benning, Georgia. Data collection will begin in July 2010 and will aim to include at least 300 participants. Results will be available in August 2010. For the objectives, methodology and survey questions see **Appendix 12**.

Additionally, the NMAA Faculty, Staff and Cadet Survey was also finalized. This survey collects Political, Military, Economic, Social, Infrastructure, and Information data from the NMAA cadets, staff and faculty. This survey is a census of all 3,000 individuals at the NMAA. Additionally, the survey is set up through an online server in order to test a viable technical model for information sharing that can be applied elsewhere. The study provides data to inform policy development in Afghanistan for the US Army as well as acquire data on some of the likely future leaders of Afghanistan that would become part of a larger database. The survey was finalized and sent to Dr. John James (West Point's Network Science Center) at the NMAA for translation. Data collection should begin in July 2010, and preliminary results will be available by October 2010. For the objectives, methodology and survey questions see **Appendix 13**.

The Provincial Reconstruction Team (PRT) survey designed to collect Humanitarian Assistance and Disaster Relief (HADR) data on PRT projects in Afghanistan was finalized and sent to Dr. John James for translation and programming. This project also tests a viable technical model for information sharing that can be applied elsewhere. Four or five cadets from NMAA will collect data on the PRT projects with a stated goal of collecting data on at least four projects with 10 - 12 interviews per project for a total of 160 - 175 responses. The cadet will utilize a Nexus One phone using the Android operating system to collect data. The data will be provided to inform policy development in Afghanistan for the US Army. The data will also be used as the first set in a larger database. The data will be brought back to NMAA and then scrubbed using specific rules to take out confidential information and then shared with United States Military Academy at West Point and CSUSB. Data collection will begin in August 2010 and preliminary results will be available in October 2010. For the objectives, methodology and survey questions see **Appendix 14**.

Agreement GT 10102 between Kemmet Schreiben Company and Foundation for California State University, San Bernardino was signed.

Agreement GT 90938 amendment three amended the Institute of Applied Research and Policy Analysis at CSUSB (IAR) project schedule. The amended performance period was from November 10, 2008 through February 28, 2010. IAR submitted a quarterly report and a white paper. Please refer to **Appendix 15** for the quarterly report and **Appendix 16** for the white paper.

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The Foundation for the California State University, San Bernardino; Integrated Information Technology Policy Analysis Research (IITPAR); and Institute of Applied Research and Policy Analysis (IAR) signed Agreement GT 10162. The performance period was from March 8, 2010 through June 30, 2010. IAR submitted the GT 10162 progress report.   See **Appendix 17**.

Task 5: *Technology Developments and Demonstration*

Agreement GT 10101 between the Institute for Human and Machine Cognition (IHMC) and Foundation for California State University, San Bernardino was signed (performance period: May 1, 2009 - April 30, 2010). IHMC submitted the following reports and software demonstrations:

1. A quarterly report for performance period May 1, 2009 through July 31, 2009. See **Appendix 18.**
2. A quarterly report and demo video for performance period August 1, 2009 through October 31, 2009. See **Appendix 19.**
3. A quarterly report and demo video for performance period November 1, 2009 through January 31, 2010. See **Appendix 20.**
4. A final report and demo video for performance period May 1, 2009 through April 30, 2010. See **Appendix 21.**

IHMC submitted a concept map for the April 6 - 9, 2010 IITPAR workshop (Indian Wells, California) brainstorm session on semantic tagging. See **Appendix 22** for the concept map image. IHMC team conducted a presentation at the April 6 - 9, 2010 IITPAR workshop.

Task 6: *Program Management*

During the first quarter, a planning meeting was held at West Point between the Network Science Center (NSC) and Integrated Information Technology Policy Analysis Research (IITPAR) on September 16, 2009. Please see **Appendix 23** for the action items from the meeting.

Several meetings were held at West Point in the second quarter involving IITPAR, NSC, and the Communications-Electronics Research, Development, and Engineering Center (CERDEC) in order to develop a proposal for technology development related to information sharing among coalition partners as part of a larger Coalition Warfare Project (CWP) proposal. The technology development portion of the CWP addressed two challenges facing the development and deployment of new information-sharing technologies: the inability of technology to link two or more network systems and the policy barriers that prevent information sharing, whether

between network systems, government agencies, military units or nations. Overcoming these two challenges involves, first, the development of new technologies and policies and second, the testing of new technologies and policies. This stage has been hampered by lack of a test bed, very often because of the security issues of any data available for testing. IITPAR participated in the development of research that makes use of the Unclassified Tactical Ground Reporting (TiGR-U) system held by the USMA at West Point. Through use of the TiGR-U test bed, new information-sharing technologies can be developed and tested and policies that hinder information sharing across boundaries can be identified and overcome in order to allow for opportunistic information sharing. The proposal titled "Sharing Valued Information in a Coalition Context" can be found in **Appendix 24**.

A meeting at the Network Science Center on December 15, 2009 was attended by Ms. Shauna Clark, Ms. Lynndee Kemmet, Mr. Dan Evans, LTC John Graham, and Dr. Kathryn Coronges, Assistant Professor of the Department of Behavioral Sciences and Leadership, USMA West Point. The outcome of the meeting was a better understanding of Network Science Center operations at West Point, their goals, short and long terms challenges and expectations about collaboration with CSUSB and specifics about research objectives.

IITPAR's Policy Working Group held conference calls each month that also involved participation from CERDEC and West Point's Network Science Center (NSC). These conference calls involved planning for the April 2010 workshop in Indian Wells, California as well as discussions related to the development of the Coalition Warfare Project (CWP).

Several direct meetings were also held at West Point involving members of IITPAR, West Point's NSC and CERDEC. Meetings were held on January 25, 2010; February 16, 2010; March 20, 2010 and March 24, 2010. These meetings were part of the planning process for the April 2010 workshop and also for the development of the CWP statement of work and budget. Two of these meetings also involved military personnel who recently returned from theater that provided guidance in the development of the CWP and the survey that was fielded to the Army Agri-business Development Teams (ADTs).

Dr. Clifford Young and Institute for Human and Machine Cognition (IHMC) staff had a quarterly meeting in Pensacola, FL from January 17 through January 20, 2010. Additionally, Dr. Young had a meeting at West Point to finalize the Memorandum of Understanding from January 24 through January 25, 2010.

During the third quarter, IITPAR participated in four working meetings with researchers from CERDEC and West Point's Network Science Center. These working meetings contributed to further development of the research design and proposed statement of work for the Coalition Warfare Project (CWP). In addition, these

meetings provided additional insight into the information needs of soldiers in theater, which contributed to the development of the CWP research design.

During the fourth quarter, Dr. Clifford Young and Mr. Bill Lowery representing IITPAR and COL Kevin Huggins representing the NSC met with groups from the American Embassy in Paris and four French Universities/Institutes, including the Technopolis Group, Institut d'Etudes Politiques de Grenoble, Institut d'Etudes Politiques de Toulouse, and Institut d'Etudes Politiques d'Aix en Provence, from June 28, 2010 through July 24, 2010. For a copy of the follow-up email sent by Dr. Clifford Young, see **Appendix 25**.

Agreement GT 10129 between Shauna Clark and Foundation for California State University, San Bernardino was signed. Performance period is from September 15, 2009 through September 30, 2010. The GT 10129 is in progress. Ms. Clark submitted proceedings from the April 6 - 9, 2010 IITPAR Workshop in Indian Wells, CA .

IITPAR Staff Listing
IITPAR was fortunate to have a great staff during FY 2009 including:
- Clifford O. Young, D.P.A., Principal Investigator
- Guenther Kress, Ph.D., Policy Research Consultant
- Sheldon Bockman, Ph.D., Research Consultant
- Barbara Sirotnik, Ph.D., Research Consultant
- Ann Marie Allen, M.A., Research Associate
- Rudy Senjaya, M.S., Research Assistant
- Cassandra Clough, M.A., Research Assistant
- Crystal Escalera, Project Executive Assistant
- Susan Knobler, Project Assistant

Quarterly Status Reports to ARL Cooperative Agreement Manager (CAM)
Quarterly Status Reports were submitted to the US Army Research Laboratory (ARL) for the periods of July 1, 2009 - September 30, 2009; October 1, 2009 - December 31, 2009; January 1, 2010 - March 31, 2010; and April 1, 2010 - June 30, 2010. These reports detailed the activities of IITPAR throughout each quarter of the contract year.

Monthly Teleconferences with Principals
Conference calls with ARL, West Point's Network Science Center, IHMC, CERDEC, Dr. Jessie DeAro (Senior Policy Analyst, Office of Science and Technology Policy, Executive Office of the President), and other participants were held during FY 2009.

Staff Weekly Meeting
IITPAR staff weekly meetings were held at CSUSB during FY 2009.

Future Directions for FY 2010

As stated in the Annual Program Plan FY 2010-11, there are eight main tasks to guide the direction in the Integrated Information Technology Policy Analysis Research at California State University, San Bernardino. These tasks include:
1. Problem Definition and Detailed Plan
2. Policy Workshops with Proceedings and Policy Working Group Quarterly Meetings
3. Research Conference Participation
4. Research and Publications
5. Network Science Research and Technology Development and Analysis of TIGR-U Technology Application
6. MOU between IITPAR at CSUSB and Network Science Center at West Point
7. IHMC Technology Developments and Demonstration
8. Program Management

For the complete program plan, refer to **Appendix 26**.

Additionally, a new agreement is in the development stages between IITPAR and the Air Force Academy's Center of Innovation, Intel Corporation and the Department of Homeland Security. They would like to use IITPAR's expertise in policy analysis and project evaluation. The project could also lead to involvement with first responders to assess their technical and information sharing needs through a survey. Furthermore, an agreement between IITPAR and the Air Force Academy could use innovative technologies to improve policy among Homeland Security and other first responder agencies.

Appendix 1

Collaboration between the NSC at USMA and IITPAR at CSUSB

Collaborative Proposal between the Network Science Center, United States Military Academy, West Point and Integrated Information Technology Policy Analysis Research, California State University, San Bernardino
September 24, 2009
GT 10102

This collaborative proposal is designed to fulfill the mission of the Network Science Center at USMA to provide educational opportunities for USMA cadets and staff and to support research that helps meet the needs of the Army. It also helps to fulfill the mission of IITPAR, as required in its Cooperative Agreement with the Army Research Labs, to assist in the development of information-sharing technology and in understanding the policy challenges that hinder technology development and its transition to the battlefield. This initial agreement between the Network Science Center at USMA and IITPAR at CSUSB is for a three-five year proposal with review and possible renewal after that time period. The areas of collaboration are as follows:

- **Collaborative Development of Information-Sharing Technology**

To meet its contract with ARL to assist in developing and deploying information-sharing technology that improves situational awareness for soldiers, IITPAR intends to collaborate with the Network Science Center to improve TIGR capabilities and address challenges of sharing information on the TIGR system with coalition partners.

- **Collaboration on Afghan Survey to Assist in Army Nation-Building Mission**

The Center and IITPAR will collaborate in the development and execution of a survey of military cadets and applicants in Afghanistan as part of a joint effort to modify a Growth Machine model applicable to nation-building efforts following military conflict.

- **Development of Internship Program for CSUSB Master's Degree Students**

The Network Science Center and IITPAR will collaborate in the creation of an internship program that will make it possible for CSUSB master's degree students to work as interns at the Center at West Point.

- **Faculty and Administrative Staff Exchange Program**

An exchange program will be developed that allows CSUSB faculty to teach or give a seminar/lecture at West Point. In return, CSUSB would welcome West Point staff to give a lecture or seminar at CSUSB.

- **Collaboration on Grant Writing and Grant Development**

IITPAR and the Center will work jointly on grant development with the goal of acquiring funding of $5-$10 million within the next 12 months to fund the collaborative efforts over the next 3-5 years.

- **Database Collection, Input, Management and Analysis**

IITPAR and the Center will work jointly to collect, manage and analyze data being gathered by Center researchers and cadets.

- **Funding of Research/Staff Support**

IITPAR will assist the Center by funding research and grant development to allow the Center to move forward the collaborative research projects being undertaken by the Center and IITPAR.

- **Joint Sponsorship of Conferences and Seminars**

The Center and IITPAR will jointly sponsor and host conferences related to their collaborative work.

Appendix 2

Project Overview presented to the French, June 28, 2010

The Innovation and Policy Analysis Project (IPA) at California State University, San Bernardino (CSUSB) and the Network Science Center (NSC) at the United States Military Academy, West Point (USMA) are working to address the technological and policy barriers that hinder information sharing as tasked by the Army Research Labs (ARL). This involves the gathering and sharing of information for both counter-insurgency and nation-building Monday, June 28, 2010 purposes. The overall goals and objectives of this research are to identify innovative science technology, cognitive science, and computer science research with an analysis of

public policy issues and legislative policies to advance US Army network centric operations and homeland security.

To address the above objectives, the IPA and the NSC have developed three distinct surveys. All three of these survey projects are also in cooperation with the Institute of Applied Research (IAR) at CSUSB. These surveys address the main research problem: To investigate the policy barriers that prevent the implementation of new technologies for information sharing and utilize technology to implement effective information sharing efforts.[1] The surveys focus on the following:

1. U.S. Soldiers who are returning from overseas deployment that will further the research into organizational and technological barriers to information sharing;
2. Cadets, Faculty, and Staff at the National Military Academy of Afghanistan (NMAA) that will collect Political, Military, Economic, Social, Infrastructure and Information (PMESII) data;
3. Afghan civilians who are participating in the Provincial Reconstruction Team (PRT) projects that will collect Humanitarian Assistance and Disaster Relief (HADR) data.

While conducting the surveys, policy barriers will be discovered and then shared with the sponsors of the programs. Eventually, the data analysis could also result in the modification of existing software or the creation of new software that would better serve the soldiers in the field. Additionally, the analysis of the Afghan data would inform policies on nation-building and humanitarian assistance for the military and other policy-makers.

All three surveys will assist in both identifying and resolving the information sharing issue. The U.S. Soldier survey is showing how information sharing is applied in the field and what can and should be changed to improve the process. As part of the NMAA project, researchers at the Network Science Center at West Point are currently engaged in research work aimed at developing and demonstrating adaptive communications network architecture. This would allow data to flow across network systems of various coalition partners when there is a change in policy, such as a decision to share policy with a coalition partner. However, as stated in previous research conducted by IAR, "information sharing is especially difficult between coalition partners who have different policies on sharing."[2]   To

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[1] Shel Bockman, Barbara Sirotnik and Christen Ruiz, "White Paper: An Empirical Study of Barriers to Information Sharing," Institute of Applied Research, April 2010, p. 1.
[2] Bockman, Sirotnik and Ruiz, p. 8.

effectively address all information sharing issues, the project needs to be expanded to include more coalition partners, specifically the French and the British.

This chart illustrates the projected flow of information through the project:
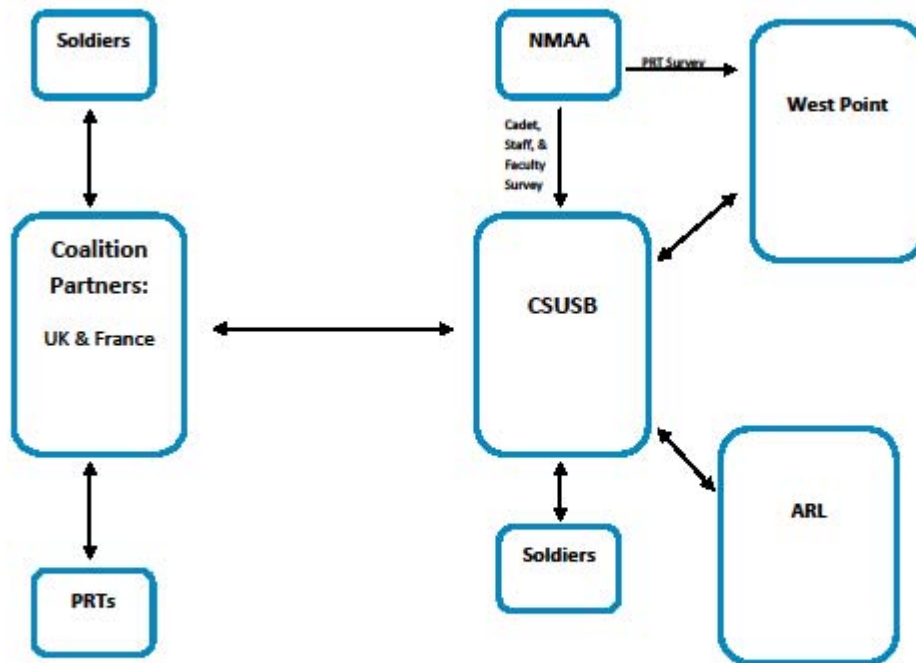
In keeping with how information will be shared in the project, there are several ways coalition partners can collaborate on the project. They include:

1. Replication of the U.S. soldier survey among French and British troops to discern how information sharing is conducted among their forces.
2. Collection of data on the PRT projects where coalition forces are involved with other PRTs. The data would then be provided to the IPA and the NSC for analysis.
3. Identification of a group similar to NMAA where coalition partners are training Afghans for security and nation-building purposes. Conduct the social science survey of these groups and then provide the data to the IPA and the NSC.
4. Participation with European groups who are studying other information sharing questions.

5. Attendance and contribution to future conferences and workshops.
6. Production of joint publications to further the scholarship on information sharing and other related topics.

The following is a supplementary explanation of the three survey projects. After each explanation, a chart illustrates how information will be shared within each survey project.

US SOLDIER SURVEY

Since U.S. Soldiers face many barriers to effective communication while in the field, this survey project will look at the variety of barriers to sharing information; some are due to technology and others are related to organizational rules and policy. In some cases, lives are at risk due to ineffective information sharing. A better understanding of these barriers will allow for specific solutions to be created.

The objectives of the study include gaining an insight into the use of technology for information sharing among deployed soldiers in the field and understand the barriers to effective information sharing. The study is also looking into soldiers' thoughts on possible improvements to effective information sharing and to see if there are repetitive tasks that can be automated thereby avoiding entry duplication. Eventually, the data will be used to hone the project goals of creating better communication technologies.

The target population for the survey is U.S. soldiers returning from a recent deployment; specifically soldiers with experience using Tactical Ground Reporting (TiGR), Combined Information Data Network Exchange (CIDNE), or other information sharing systems. The population will be a random sampling of the soldiers once they have returned from deployment. Ideally, a one-on-one twenty-minute interview will be conducted utilizing a semi-structured survey instrument. Additionally, the soldiers, due to logistical constraints, will complete a paper survey with the same questions. The information from the interview will be transcribed into the Statistical Package for the Social Sciences (SPSS) system via access by the interviewer.
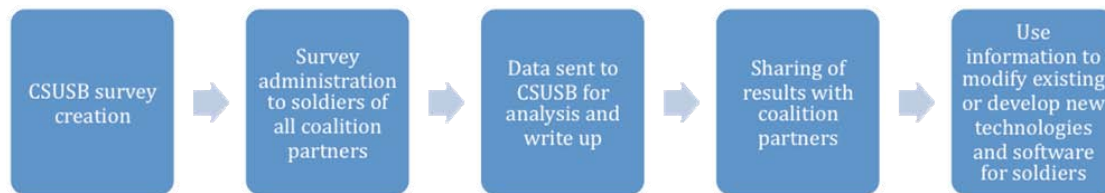
AFGHAN SURVEY- NMAA CADET, STAFF AND FACULTY

According to the United States Agency for International Development (USAID) website, the U.S. government has six objectives for their role in Afghanistan, namely to:

1. Strengthen the Government of the Islamic Republic of Afghanistan (GIRoA) so that it can provide basic services to the citizenry, promote national unity, and fight corruption;
2. Develop self-reliant Afghan security forces that can lead counterinsurgency efforts and contribute to better overall security for the Afghan people;
3. Promote economic growth to reduce poverty, stimulate investment and business opportunities, and generate sustainable employment by expanding markets;
4. Increase access to quality basic health services, quality education and advancing the role of women in society;
5. Expand access to social and economic infrastructure, including roads, schools and health clinics as well as improving energy and power; and
6. Increase access to information by strengthening an independent media through technical support, equipment upgrades and hands-on training, which is vital to the democratic process and the development of a civil society.

However, optimism for the direction Afghanistan is taking has been low among the Afghan people, as they are having a "crisis of confidence" in both their own government as well as the international community. By collecting data on Political, Military, Economic, Social, Infrastructure and Information (PMESII), it will help assess the current levels of support for U.S. programs as well as give insight to the problems facing the Afghan people. It is important to assess the attitudes and beliefs of the Afghan people as well as the frequency they are experiencing both desirable and undesirable events in order to more effectively meet the outlined objectives.

The objectives of the study include collecting PMESII data from the National Military Academy of Afghanistan (NMAA) cadets, staff and faculty. Additionally, we will set up a viable technical model for information sharing that can be applied elsewhere. The study will provide data to inform policy in Afghanistan for the US Army as well as acquire data on some of the likely future leaders of Afghanistan that will become part of a larger database.

The target populations for the study are the 3000 NMAA Cadets, staff, and Faculty believed to be "The future leaders of Afghanistan." The ethnic distribution of the staff, faculty, and cadets reflects the broad cultural diversity of the nation and they have intimate knowledge of the social and cultural aspects of the country. We will use a census method for the approximately 20 to 30 minute survey, which will be completed online via a computer in their native language (Dari). We believe that the data can be loosely applied to the Afghani population as a whole since demographic make-up of NMAA closely resembles Afghanistan.

CSUSB survey creation → Web based survey administration at NMAA → Data accessed and analyzed by CSUSB → Sharing of results
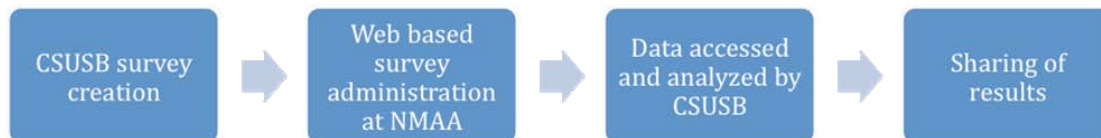
AFGHAN SURVEY – PRT PROJECTS

The overall Provincial Reconstruction Team (PRT) concept in Afghanistan is to use relatively small joint civil-military units to achieve three objectives, which include improve security, extend the authority of the Afghan central government, and facilitate reconstruction. PRTs depend on the cooperation and goodwill of the local decision makers who include so-called *Power Brokers*. Currently, there are 26 PRTs that consist of approximately 60-250 military personnel, a USAID field officer, a Department of State (DOS) political advisor, and a United States Department of Agriculture (USDA) advisor. Over 440 projects have been completed thus far, including community and government buildings, clinics, schools, capacity building for government, radio stations, gender activities, agriculture, water/irrigation projects, energy (micro-power), and roads.

The objectives of the project comprise the collection of Humanitarian Assistance and Disaster Relief (HADR) data on PRT projects to learn Afghan civilians'

impressions of the individual projects. Additionally, we will set up a viable technical model for information sharing that can be applied elsewhere. The data will be provided to inform policy on Afghanistan for the US Army. The data will also be used as the first set in a larger database.

The target population of the survey project is the Afghan civilians who are involved with various PRT projects located throughout the country. Four or five cadets from NMAA will be assigned to one PRT that conducts numerous projects. They will collect data on the PRT projects with a goal of collecting data on at least four different PRT projects with 10-12 interviews per project for a total of 160-175 responses. The security of each cadet will be taken care of since each PRT "do[es] not engage in combat operations; however, they retain robust force-protection capabilities that are used to facilitate [their work]." The cadet will utilize a Nexus One Phone using the Android operating system to collect data. A stratified sampling of certain categories will be conducted. The survey interview will consist of approximately ten questions with the majority very short with drop down answers and other to do a short fill-in if necessary. Instructions and training will be given via video and in-person. The data will be brought back to NMAA and then scrubbed using specific rules to take out confidential information and then shared with USMA and CSUSB.
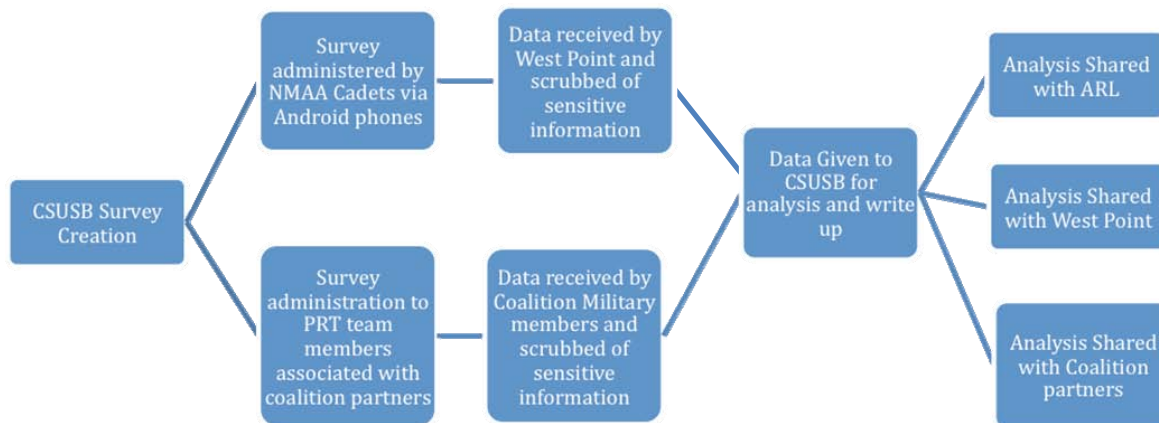
Appendix 3

Fiscal Year 2009 **[Annual / Final Report]**

Email from Dr. John James outlining the Afghan project, September 1, 2010

From: James, John R CIV USA USMA [mailto:John.James@usma.edu]
Sent: Wednesday, September 01, 2010 11:29 AM
To: Clifford Young
Cc: McGowan, Raymond Mr CIV USA AMC; Mabry, Frank J CIV USA USMA; Huggins, Kevin COL MIL USA USMA
Subject: RE: Follow up

Clifford,

Sorry I did not receive your earlier email!

The efforts in Afghanistan went well but, like last year, I did not get as much done as I had hoped.

The survey was translated and I had all of the interpreters take the survey. Attached is the last English version of the survey I received and the translated version. I have not yet placed the completed surveys in the mail but I will later this week.

The arrangements for the cadets to go out to the Provincial Reconstruction Teams (PRTs) took longer than I had hoped because of the reorganization of the International Security Assistance Force (ISAF) headquarters into a four-star headquarters and the formation of the two subordinate three-star headquarters. The office that had been coordinating the PRTs was eliminated and the PRT coordination moved from ISAF headquarters to the ISAF Joint Command (IJC). The final result is that five cadets are currently at PRTs but they departed for the PRTs after I had left to return to the states. I gave five lectures on programming the Android phones to the Computer Science faculty and hand-receipted the six Android phones with the NMAA logistics folks who hand-receipted them to the CS department. While they will be able to be used for program development and instruction, the phones will not be used for collecting PRT data until the next semester break.

The Network Attached Storage (NAS) device software has been finished and is installed on a NAS at USMA. The NAS device for the mentor team has arrived at Kabul but is not yet operational. We are coordinating a session with the NMAA mentor team to get the NMAA node operational. We are configuring a NAS device for CSUSB and it will be shipped shortly with instructions on its use. There is also interest at the US Air Force Academy in purchasing a NAS device and installing the software to create a set of information sharing nodes among CSUSB, USMA, NMAA, and USAFA.

Ray McGowan and I have also had an email exchange about resubmitting our proposal for a Coalition Warfare Program (CWP) project to the DoD CWP office as requested by their manager last Spring. Ray and I will be at a meeting in the UK in a couple of weeks and would like to discuss the DoD CWP project ideas with the Brits. We will be developing a draft proposal and sending that around in the next few days.

Cheers,
John

John James, Ph.D., PE, CISSP
Associate Professor and Adam Chair in Information Technology
john.james@usma.edu , http://www.netscience.usma.edu 845-938-5563, FAX: 845-938-5956, DSN: 688-5563

Appendix 4

IPA Policy Working Group Meeting at USMA at West Point, August 4, 2009

Members of the IPA Policy Working Group met at the United States Military Academy at West Point on August 4, 2009 for an opportunity to observe how TiGRNet is used in the field by cadets during their summer field training exercises. In addition, Policy Working Group members were given the opportunity to meet with, and query, not only individuals (Brian Slaughter) involved in the development of TiGRNet, but also officers and enlisted personnel who had used the network system in action in Iraq and Afghanistan. The meetings provided an opportunity for the Policy Working Group not only to gain information on TiGRNet from a user perspective, but also to engage in discussions on the technological aspects of the network system.

A debriefing followed the morning observation session in which the Policy Working Group and West Point staff began the initial stage of planning for an October TiGRNet Users Conference to be held at West Point. The potential dates for the conference at this point are October 13 - 14. In addition, discussion was begun on a follow-up TiGRNet Users Conference to be held in the Palm Springs, California area around the end of January 2010. The initial concept for that second conference is to probe more deeply into TiGRNet issues that arise during the first conference and to broaden participation, particularly by having, at that conference, personnel from Ft. Irwin.

Summary of key issues that arose during the meetings:
- There is a larger policy question regarding two potentially conflicting perspectives in the Army – horizontal versus vertical information-sharing structures.

- Information does not flow seamlessly between various network systems in use on the battlefield. Hence, there is much duplication in terms of data being re-input into the different systems. This is viewed by TiGRNet developers as a policy problem, not a technology problem.
- There is the issue of hard versus soft data.
- The PWG has an interest in understanding the failure of a previous Army program on Horizontal Fusion.
- Most current network systems are incapable of managing cultural indicators, which are important, but not always captured in data.
- TiGRNet is gaining interest among civilian agencies and first responders. A commercial version called Saber does exist.
- A key policy in development of any additions to TiGRNet is that it must not take more than 30 minutes to learn how to use that new function.

A closing meeting among Policy Working Group members resulted in agreement on the following action items:

- Ray McGowan will take the lead in working with LTC Merlo on the organization of the TiGRNet Users Conference. Current dates are October 13 - 14, set to coincide with West Point's Network Science Conference.
- Access to TiGRNet data and scenarios remains a barrier to development of the IPA tool. Ray McGowan is working to gain access to TiGRNet data through the U.S. Army Training and Doctrine Command (TRADOC). West Point does have an unclassified TiGRNet database that is used in their cadet training scenarios. Ray McGowan will take the lead in learning more about the West Point database and training scenarios while also pursuing the TRADOC data. The PWG agreed that using the TRADOC data was the best option, but the West Point data would be an alternative plan should the TRADOC data not be forthcoming in the next couple of months.
- Ray McGowan is to send to LTC Merlo an email that has the email addresses of all who attended the August 4 meetings. Merlo can then circulate this among his group and keep everyone in the loop on planning for the TiGRNet Users Conference.
- Dr. Clifford Young will take the lead in acquiring a keynote speaker for the January TiGRNet Users Conference in Palm Springs.
- LTC Merlo is to provide the PWG with a budget for the January TiGRNet Users Conference.
- Lynndee Kemmet will work with Dan Evans to gain access to cadet research papers that have examined the TiGRNet system and the information-sharing structure in the Army.
- IHMC has invited Capt. Bernard to IHMC for further discussions on use of TiGRNet. Jeff Bradshaw is taking the lead in organizing this meeting and arranging travel for Capt. Bernard.
- Dr. Clifford Young is to schedule a teleconference for the PWG either for the last week of August or first week of September.

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Appendix 5

Meeting between IITPAR and NSC at West Point, September 2 - 4, 2009

In this initial stage of discussion on developing a joint collaborative project between CSUSB and the Network Science Center at West Point, the constraint for CSUSB is that, until a separate collaborative project and funding is set up, any assistance CSUSB gives to the Center at West Point, must fall within the scope of IITPAR. Therefore, funding support from CSUSB in the initial stage of collaboration will be from IITPAR's 2010 funding and initial collaborative work will be within the scope of the IITPAR 2010 Annual Plan. The constraint for West Point is that any joint venture must contribute to its mission of educating and training cadets. With these constraints in mind, it was agreed that in this initial stage the following steps would first be taken:

1. Survey cadet candidates at the National Military Academy of Afghanistan (NMAA) to assess the current status of nation-building efforts as perceived by those who aim to enter NMAA as cadets. The goal of this effort is to take the first step toward a collaborative project aimed at developing a model for growth in order to assist in the process of nation-building following military conflict. We will use the unclassified version of the Tactical Ground Reporting (TiGR-U) system to capture and share information. As part of this action item:

   a. CSUSB is developing the first draft of the survey that is to be included in the application process to NMAA. The first draft is to be completed and circulated for review by September 14. We will meet again at West Point on September 16. The website of USAID does provide background information on Afghanistan and will give some sense of information that is not yet collected but could be in the survey.
   b. John James will provide to CSUSB the database of information of what is now collected by NMAA so that CSUSB can see what information is missing that can be added in the survey.
   c. West Point staff members are making contact with key people on the ground in Afghanistan to get approval for undertaking the survey and to get information on the dates for the application process and to connect with people on the ground who can assist in the administration of the survey.
   d. West Point staff will make contact with a team of individuals who have experience executing actions, such as surveys, on the ground in battlefield situations and will handle the plan for execution of the additional application questions and survey.

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    e. West Point staff members are also working on design updates to TiGR such that information collected in the survey can be loaded directly on to TiGR. This is part of a similar effort to design TiGR for use on disaster assistance projects.

    f. West Point staff will also handle the process of pre-testing our survey with USMA cadets.

2. We will consider using this survey and our work on nation building for a report to be available in time for the Senior Leaders Conference in June 2010. Already on the agenda is a section on the Provincial Reconstruction Teams that are involved in nation building on the ground.

Appendix 6

West Point Planning Meeting, November 20, 2009, West Point, New York
GT 10102

Planning meetings at the U.S. Military Academy brings together all parties involved in the development of the Coalition Warfare Project, planning for the April 2010 IPA-sponsored workshop in Indian Wells, California and the joint CSUSB-West Point collaborative project.

Agenda:

1. Coalition Warfare Project (CWP): The proposed Coalition Warfare Project seeks to identify and remove both technological and policy barriers to information-sharing among coalition partners. The project, as proposed, involves the U.S., Afghanistan, France and the United Kingdom. The proposal revolves around use of the Unclassified Tactical Ground Reporting (TiGR-U) system between USMA (West Point) and National Military Academy of Afghanistan (NMAA) in Afghanistan to collect and share PMSEII (Political, Military, Social, Economic, Information and Infrastructure) data focusing on social cultural information to assist with the task of "Building the Network" in Afghanistan. Topics for this portion of the November meeting:

    a. Discussion of draft CWP proposal.
    b. Discussion and update regarding involvement of French and British counterparts in the project.
    c. Discussion of execution of survey and data collection by Afghan Military Academy cadets.
    d. Discussion of technological and policy barriers that need to be addressed in the CWP.

2. April 2010 ITTPAR-Sponsored Workshop: In April 2010, IITPAR will play host to a TiGR Users workshop that will serve as a follow-up to the October TiGR Users workshop that was hosted by West Point. A draft agenda for the workshop has been developed and will be under discussion. Items for discussion during this portion of the November meeting include:

   a. The proposed list of invitees.
   b. Proposed agenda for the workshop.
   c. The process for inviting and ensuring the participation of soldiers from the field who operate at platoon level and below.

3. Collaborative projects between IITPAR at CSUSB and the Network Science Center at the USMA at West Point.

Appendix 7

Executive Summary of Workshop Proceedings
"Information Sharing on the Front Line: Critical Perspectives of Soldiers as Gatherers, Analyzers and Users of Situational Information"
Indian Wells, CA, April 6 - 9, 2010
GT 10129

On April 7, 2010, the Integrated Information Technology Policy Analysis Research team of California State University, San Bernardino, headed by Dr. Clifford Young, along with the Center for Network Science, United States Military Academy at West Point, under the direction of Lieutenant Colonel John Graham, convened an extraordinary workshop to further their efforts to remove barriers that hinder information sharing with and among soldiers in combat zones and first responders in urban settings.

The forty-two workshop participants included military leaders, front-line soldiers and cadets, a current and a former member of Congress, principal investigators from the scientific and academic communities, researchers, corporate executives, and DC Agency heads. They represented the United States Military Academy at West Point, Intel Corporation, the Department of Homeland Security, SouthCom, CERDEC's Coalition Warfare Project, the Kansas State National Guard Agribusiness Team, the Royal Army of the UK, the USAF Academy's Center of Innovation, the Institute of Human and Machine Cognition, the US Army Research Laboratory, the Institute of Applied Research and Policy Analysis, the Office of Technology Transfer, and the Innovation and Policy Analysis group from California State University, San Bernardino.

The workshop proceedings include statements from soldiers, just thirty days out of Afghanistan, and from officers at the US Military Academy, who spoke candidly about the organizational, cultural, technological and policy barriers that hinder their ability to share situational intelligence. Shared information is critical to humanitarian assistance and disaster recovery operations and for saving the lives of citizens and soldiers. One focus of the workshop was the Tactical Ground Reporting Network (TiGR Net), a global intelligence sharing platform currently deployed in parts of Afghanistan. By learning about the pros and cons of TiGR, scientists and researchers can make better decisions about the types of technology being developed and tested at this time.

Workshop participants also presented the results of research and personal experiences with various forms of technology and the cultural dynamics within Afghanistan. The group worked together to tackle obstacles and suggest solutions for further study.

Workshop Proceedings reveal some of the barriers to information sharing which include:
- Organizational resistance to information sharing within the Department of Defense
- Lag time and inconsistency in technology development and deployment
- Inability to demonstrate technology in a tactical environment
- Failure of the research community to understand that cultural and tribal behaviors vary by situation, moment to moment, and village by village
- Conflicting requirements for legality, security, and effectiveness related to data exchange
- Limitations associated with closed systems
- Hyper-caution including the complexity of wicked problems
- The human tendency toward over-classification
- Inability to communicate with coalition partners and even within the US military from unit to unit due to differing protocols and technology applications
- The military acquisition process which is too slow and cumbersome
- Difficulties in the portability and exchange of data
- Getting beyond the wire (away from internet access)

The Proceedings also provide some key findings and reveal lessons learned. Lessons learned included the importance of:
- Constructing a common operating picture and how technologies such as TiGR-net can be used for that purpose
- Building a better knowledge base by linking data coming in from other sources
- Changing information management from a focus on securing information to a focus on sharing information

- Flowing information among individuals and groups that are not normally "on the net", especially for humanitarian assistance and disaster recovery operations
- Information sharing would be more valuable if reach-back were not eliminated
- Finding ways to fuse fact with weighted opinions to achieve reliable situational analysis
- Learning more about network science, which accepts that because we are relationship-based we are all in an "inescapable network of mutuality"
- Gaining the perspectives of soldiers during technology development
- Making incremental changes to existing technology rather than starting over with each new software and technology development
- Understanding the impact of Rules of Engagement on operational scenarios

At the end of the two and a half day workshop, participants agreed on the benefits of the sessions, the importance of continuing and expanding the collaboration, and the need to reconvene with invitations to the Defense Advanced Research Projects Agency (DARPA) and others who are critical to developing solutions for removing the barriers to information sharing.

The entire Workshop Proceedings are posted on the California State University, San Bernardino Innovation and Policy Analysis web site at www.ipa.csusb.edu.

Appendix 8

A Model for Addressing Policy Barriers for Military Information Sharing Technology

Submission for: The International Academy of Business and Public Administration Disciplines, Conference in Memphis, TN, October 22 - 25, 2009

Author: Dr. Clifford O. Young, California State University, San Bernardino

Abstract

Despite calls from Congress and the White House for increased speed in the process by which new information-sharing technology is deployed to warfighters on the ground, the military acquisitions process remains long and cumbersome. At times, the process is so slow that technology becomes outdated before it ever hits the ground. This is particularly the case with new technologies that advance the Army's

move toward Network Centric Warfare. The Integrated Information Technology Policy Analysis Research Project (IITPAR) at California State University San Bernardino (CSUSB), in partnership with the Army Research Laboratories (ARL), is engaged in research to identify and remove the policy barriers that hinder the movement of new information-sharing technologies from development to deployment.

There has been a heightened awareness throughout the United States military of the important role of information-sharing networks in battle, which has resulted in an emerging theory – Network Centric Warfare – that seeks to use Internet technology to collect, analyze, transfer and share information among decision makers on the battlefield to create shared battlespace awareness. Achieving this, however, requires shifts in both bureaucratic and public policy. Current policies reflect such things as concerns for privacy and security and rules regarding information sharing among federal agencies, military branches and coalition partners.

Identification and analysis of these policy barriers by researchers is hampered by security concerns surrounding intelligence-gathering systems and data. IITPAR is engaged in an effort to identify and analyze information-sharing policy barriers through modification of battlefield technology for nation-building efforts. This effort aims to develop a model for identifying and overcoming policy barriers to information sharing among separate entities engaged in military operations, such as military branches, federal agencies and coalition partners and to assist in modification of a battlefield technology for nation-building efforts. Development of this model for application to nation-building efforts will allow for future application of the model to information-sharing involving battlefield operations. This presentation discusses this model and its application to military technology used for information gathering and sharing.

Appendix 9

Summary Research Design Coalition-Information Sharing using TiGR-U
October 15, 2009
GT 10102

The development and deployment of new information-sharing technologies faces two main challenges – the inability of technology to link two or more network systems and the policy barriers that prevent information sharing, whether between network systems, government agencies, military units or nations.

Overcoming these two challenges involves first the development of new technologies and policies and second, the testing of new technologies and policies.

This stage has been hampered by lack of a testbed, very often because of the security issues of any data available for testing.

The USMA at West Point has developed a TiGR-U network system that involves the use of unclassified data and that links the USMA at West Point with the National Military Academy of Afghanistan (NMAA). Because the data shared between the two entities is unclassified, it removes the key barrier to development of a testbed for new information-sharing technologies and policies.

The development of a research project is now in the process that will use the USMA-NMAA connection through TiGR-U by which new information-sharing technologies can be developed and tested and by which policies that hinder information-sharing across boundaries can be identified and overcome to allow for opportunistic information sharing. It is now a goal to extend this research project to a multilateral project by bringing in the UK or France as a third partner in order to demonstrate network enable warfighting capabilities using novel research and technologies. The goal of this project will be to allow two or more nations to share information (unclassified data/info) collected by NMAA cadets at various Provincial Reconstruction Sites across the country that will not only provide insights into the status of the various national provincial reconstruction projects in Afghanistan but that will also provide useful relevant local population information in the vicinity of the reconstruction project.

Currently being developed for TiGR is a Human Assistance/Disaster Recovery (HADR) interface that will support collections of governance entities at the 1) Village/Hamlet, 2) District and 3) Province level. The system will collect reports on 1) Governance, 2) Food, 3) Health, 4) Shelter 5) Infrastructure and 6) Death and Injury for the various governance entities using the Red, Amber, Green status indicator. Lastly, the system will associate events/places to data collections and reports. The events and places will include a standards list of HADR events, plus events specifically conducted by such organizations as the United Nations Office for the Coordination of Humanitarian Affairs (UNOCHA), UN World Food Program (UNWFP), Doctors Without Borders, Afghanistan Information Management Services (AIMS) and the Save the Children Alliance.

One of the most important aspects of this project is that it allows the participants to experiment in an unclassified information-sharing realm while addressing some challenging real-world scenarios involving policy, cultural and process differences in workflow, and the ability to semantically-enable information exchanges so that information can be moved through a communications network based on its utility to the mission.

Currently, three key areas of investigation have been identified for this project:

1) Information Networking - Flowing Valued Information (allowing information

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utility with respect to mission context, to control information dissemination in a bandwidth limited environment).

2) Policy-Aware Network Processing - Implementing multi-lateral information sharing policies at a network level for sharing PMSEII data set about Afghanistan,

3) Examining cultural and process differences in workflow - Cultural and policy issues that surround multi-lateral use of PMSEII data (especially if the data contains data about individuals.)

Appendix 10

Coalition Warfare Project: Developing Information Management for a COIN Strategy

GT 10102
March 31, 2010

The strategy being employed in Afghanistan by the U.S. military is one of counterinsurgency (COIN). COIN is a strategy that focuses less on defeating an enemy than on winning over the population. The theory behind this strategy is that the strength of the "enemy" is rooted in its support from the population. Remove that support and the insurgency crumbles. The shift from Cold War-era strategy, which was designed for 'force-on-force' combat, to the current COIN strategic approach, has required a change in thinking among military commanders. In the U.S. Army, three leaders in this intellectual shift have been Gen. Stanley A. McChrystal, Gen. Peter Chiarelli and Maj. Gen. Michael Flynn.

Whether or not the era of force-on-force fighting, in which big armies from one country battle big armies from another, is dead and gone remains to be seen, and a good number of civilian and military policymakers have yet to adopt the strategic shift to COIN. However, military strategists do predict that U.S. forces are far more likely to find themselves engaged in combat that involves decentralized insurgents than in combat in which U.S. forces are engaged against large, well-organized army units.

In this era of COIN warfare, information plays a central role. The speed at which information can be collected, analyzed and shared is of great importance in COIN efforts. COIN warfare is more decentralized, resulting in a flatter military organization and the flow of information must follow that shift in structure. In the traditional, more hierarchical, military structure, information flowed upward to higher levels of command. There it was analyzed and decisions were made with regard to what information was needed back down the line. That information was then packaged and sent downward.

This may never have been an effective method for the use of military intelligence, but it is even less so in COIN warfare.

The new information structure for COIN focuses not only on keeping information closer to the troops on the front lines, but it also requires the collection and use of different information. A COIN strategy requires information about a people, meaning an entire population, not about some people within that population. In implementing a COIN strategy, however, military commanders have discovered huge gaps that traditional intelligence gathering has not been able to fill. A widely-used military acronym that defines this gap is PMESII (political, military, economic, social, information and infrastructure), which means that COIN requires a need to understand such things as political power within societies, cultural and social traditions and economic conditions, as well as the military situation. This is not the sort of information on which past military intelligence analysts focused. The result is that many military intelligence analysts, and the technologies they use to gather, analyze and share information, have been insufficient for a COIN strategy. Success now requires that analysis and technologies be transformed to adapt to the COIN strategy.

The COIN strategy of winning over the population means that U.S. military forces have taken on roles that, in the past, they have only undertaken on a very limited scale. Soldiers are building roads and schools, planting crops and vaccinating farm animals, developing economic markets and providing business training, as well as sharing in local government decision-making. Army missions related to humanitarian assistance/disaster relief (HADR) and reconstruction are a large part of the Army's overall mission in Afghanistan and Iraq. And while attention is most focused on these two nations, Army commands in such areas as African and Latin America, are also now quite involved in economic development missions in unstable nations. These reconstruction missions by the Army are likely to increase in the near future and the successful management of information will be central to their success.

However, because COIN is a somewhat novel approach to for a military steeped in Cold War strategy, the information aspect of the COIN strategy is at yet not fully developed. The successful implementation of a new strategy for military intelligence that fits the COIN strategy must address four information challenges. The first is to understand what information is needed in a COIN approach to warfare. In other words, what does the U.S. military need to know in order to successfully implement a COIN strategy within a population?

A second challenge consists of how best to analyze that information and at the lowest level at which action is to be taken based on that information. The view of COIN supporters within the military structure is that analysis is often best performed at the lowest level, such as by those who will actually use the information to take action. In addition, the Army, in particular, has moved toward using social network analysis as a best method for analyzing information and training in that methodology is now being provided to frontline troops.

A third challenge relates to technology and its use for the collection, analysis and sharing of information. Collection of information most needed for a COIN strategy has required the development of new technologies that allow for easy collection and management of PMESII data. Currently, the development and deployment of such technologies is behind the need for them, meaning that the soldiers are as yet using technologies not designed to fit the needs of a COIN strategy. Newer information technologies geared toward the needs of COIN missions need to be development and deployed more rapidly.

A fourth information challenge that must be addressed for the increased success of the COIN strategy relates to barriers in information sharing. COIN efforts have a greater need for information sharing and at a more rapid rate than in the past. A flatter military structure requires greater capability for small units operating on the frontlines to easily access and share information. In addition, as COIN missions involve greater interaction between military units and civilian entities engaged in HADR and reconstruction projects, there is a greater need to share information between military and civilian government units and non-governmental organizations. However, there are barriers to this information sharing. Some are technological – entities are operating on different network systems and those systems have limitations – and some relate to policy – rules and regulations prohibiting information sharing, especially if classified information is mixed with unclassified.

A joint coalition warfare project (CWP) developed by the Network Science Center at West Point (NSC), the Army's Command and Control Directorate of the Communications-Electronics Research, Development and Engineering Center (C2D CERDEC) and the Innovation and Policy Analysis Project at California State University, San Bernardino (CSUSB) is working to address these challenges. Research and survey projects undertaken through the CWP are working to address the first challenge by learning what information is needed by Army HADR and reconstruction missions to achieve success. The survey work is also providing information related to the fourth challenge by identifying both technology and policy barriers to information management and sharing. In addition, the CWP project is addressing the third challenge by helping to develop technologies geared toward information collection and analysis for HADR and reconstruction missions. And, through the Network Science Center, CWP team members are also addressing the second challenge by participating in training soldiers in social network analysis.

A three-year research plan has been developed for the CWP. Two groups actively engaged in Army HADR and reconstruction missions have been identified as targets for gathering information related to the first and fourth challenges identified above. These are Provincial Reconstruction Teams (PRTs) operating in Afghanistan and Army Agri-business Development Teams (ADTs). In addition, the survey work related to PRTs in the initial year of the research project design also involves the development of technologies to address the first and third challenges described above. Some of the surveys and interviews for the CWP are being undertaken in conjunction with the

Economic Networks team at the Network Science Center at West Point (NSC). Other surveys are being developed by the CWP team in conjunction with the National Military Academy of Afghanistan (NMAA) in which NMAA cadets will be embedding with PRTs operating in their home areas. Those cadets will then perform survey work using technologies being developed by the CWP.

NSC's Economic Networks team is engaged in research related to economic development in least developed nations, including Afghanistan. The team is fielding surveys and undertaking interviews with PRT members returning from Afghanistan and undergoing the debriefing process at Ft. Benning, Georgia and with ADT members, both those who have returned from Afghanistan and those who are still in theater. The CWP has tagged onto these surveys and interviews questions related to information gathering, analysis and sharing. The ADT survey has already been fielded and a copy of the survey questions is below. Results from that survey are being collected and analysis will be performed in Spring 2010. The Ft. Benning survey and interviews are scheduled to begin in Spring 2010. An initial survey project with NMAA is scheduled for August 2010 with results being analyzed in Fall 2010.

Initial survey work and research, including that performed by Shel Bockman, Barbara Sirotnik and Christen Ruiz at CSUSB, point to organizational culture as a factor with regard to barriers to information sharing. Current military policy gives commanders on the ground the authority to make decisions with regard to information management. Commanders can decide with whom to share information, what information to share and when. The policy exists, but initial survey research indicates that barriers at the frontline to implementing this policy successfully involve technology – lack of connectivity, system flaws, use of multiple technologies and systems, etc. – and a culture that does not support information sharing. These point to the need are not only for better information management technologies but also the encouragement of an information-sharing culture at the bottom.

It is likely that a cultural shift within the military toward acceptance of information management that best fits a COIN strategy will take a generation to achieve. However, it is believed that the work of the CWP will assist in overcoming the four information challenges mentioned above or, at the very least, point military and civilian policymakers in a direction that will lead to solutions. Below is a more detailed description of the three-year research plan for the CWP.

Coalition Warfare Project Multi-Year Research Plan

The project involves three entities – the Network Science Center at West Point (NSC), the Army's Command and Control Directorate of the Communications-Electronics Research, Development and Engineering Center (C2D CERDEC) and the Innovation and Policy Analysis Project at California State University, San Bernardino (CSUSB).

Project Description:

The primary goal of the CWP is to demonstrate a capability of providing bi-directional access to information across a security boundary based on commanders' declarations of "need to share" policies without affecting security status of other information protected by existing "need to know" policies. We will demonstrate this capability by passing sensitive, but unclassified, data within a humanitarian assistance disaster relief (HADR) context between systems at the USMA running on the Non-Classified Internet Protocol Network (NIPRNet) and a coalition partner in Afghanistan that is outside the NIPRNet.

The ultimate objective of this effort is to demonstrate bi-directional sharing of Humanitarian Assistance/Disaster Recovery (HADR) information across a security boundary with a coalition partner in accordance with a commander's declaration of a "need to share" the information. In doing so, we will create a mechanism to support information sharing between U.S. Forces and entities that may have critical political, military, social, economic, infrastructure, and information (PMSEII) data that do not have access to classified US/NATO tactical networks. "Building the Network", both social and information networks inside of Afghanistan will be required to support the new U.S. national strategy for Afghanistan which consists of sequenced operations across three lines of operation: Security, Governance, and Reconstruction and Development.

In addition to addressing technological challenges related to information management, the CWP also seeks to address policy barriers to information sharing and to address the challenge of identifying, and filling, the information gaps related to Army HADR and reconstruction missions. In doing so, the project is working with the Economic Networks team at NSC gathering data on information needs of Army Agri-business Development Teams (ADTs) and the Provincial Reconstruction Teams (PRTs) engaged in reconstruction missions in Afghanistan. Initial discussions with these teams indicate that this survey project will provide us with insight into the information-sharing barriers – in terms of both technology and policy – that units engaged in HADR/reconstruction are facing on the ground. Within the areas of operation of ADTs and PRTs are both U.S. and coalition military units, Afghan and U.S. government agency staff, local Afghan rulers and various non-governmental organizations. This work is providing insights into the challenges in information sharing among multiple entities engaged in reconstruction efforts. The survey and interviews with these team members is providing the CWP with guidance in the development of technologies related to the collection of HADR and PMSEII data.

Roles:

The Network Science Center at West Point (NSC) and CERDEC

The core of the CWP project effort to be undertaken by NSC and CERDEC is achieving technology transition of the Flowing Valued Information (FVI) project result for moving information across a security boundary in accordance with a commander's decision to share the information. The implementation of automation support for a commander's

declaration of a policy of a "need-to-share" a given set of information elements will leverage existing TIGR-U network nodes at USMA and NMAA to flow information between these nodes. Ideally, we will demonstrate extending this core information network result to include, at least, a third-nation to create a more complex information sharing and policy environment to evaluate both flowing valued information and policy based management technologies that are being developed at USMA and US/UK ITA, respectively.

The method that will be used to accomplish the data collection is to provide a select group of NMAA cadets and equip them with the TIGR-U application on a laptop and potentially on an I-Phone or an Android phone. During their semester break, the cadets will use the systems to collect information at a Provincial Reconstruction Site near their home. In the simplest implementation, the cadet will not have connectivity with NMAA and would collect the information on site, store the data locally and upload the data to the NMAA network upon their return to the academy.

In sum, NSC will take the lead, working with CERDEC, in the development of the technologies being developed under the CWP to support Army humanitarian assistance/disaster relief (HADR) and reconstruction missions. The following work will be undertaken by the Flowing Valued Information (HVI) team at NSC:

- Software components that will be used in an unclassified environment to enable our warfighters to leverage and share PMSEII data with local nationals, non-government organizations (NGOs) and coalition partners in support of HADR operations in Afghanistan. This software will be released as open-source and non-proprietary and will not only extend the user interface for TIGR to support the HADR domain, but it will also enable software modules to implement mechanisms for assessing the utility of information supporting the workflow and creating policy-aware applications to address the various information sharing policy constraints on the participating parties on the unclassified network.

- A prototype implementation of a capability to provide automation support of a commander's declaration of a "need to share" designated information with designated individuals and/or groups over a selected interval of time and selected area of operations. Such "sharing events" will occur based on an interaction with an informed user at the security boundary of the commander's organization. The contents of the information being shared will be displayed for concurrence by the commander's designee. This "sharing implementation" user may disapprove all or some of the individual messages transiting an organizational boundary as an aggregate at the same time. The implementation will enable maintaining support for existing policies for protecting categories of information by restricting access based on a "need to know" while enabling sharing of categories of information by allowing access based on a "need to share".

IITPAR at California State University, San Bernardino

The over-arching policy theme will be led by the Integrated Information Technology Policy Analysis and Research Project (IITPAR) at California State University, San Bernardino (CSUSB). CSUSB is addressing the challenges that policy introduces when one attempts to enable Full Spectrum Dominance in a network-centric environment, but addressing it from the specific use case of a deployment of TIGR-U. TIGR-U will assist with the critical warfighter capability gap of insufficient support mechanisms for gathering PMSEII information to support the Current Force. There is also a longer term strategic goal of "Building the Network" in Afghanistan. One of the grand policy challenges that can be addressed, given the rate of Moore's Law and the success of Agile Development to meet the warfighter's need within the information technology arena demonstrated by DARPA programs such as CPOF and TIGR, is the question of 'Can DOD acquisition policy and implementation processes support the agile development paradigm that appears to be the current path to successful system creation and deployment?'

CSUSB will also have the central role in data management. Data collected from all three projects will be stored on CSUSB secure servers. CSUSB staff will also assist in collecting data, categorizing data, updating data and analyzing data. In addition, CSUSB will be responsible for managing requests for the sharing of data with sources outside of the team members. CSUSB staff will also participate in research related to understanding policies related to information sharing.
CSUSB will take the lead in the design of surveys and in the collection, management and analysis of data gathered through the CWP. This work consists of:

- Production of a research design document that will define the goals and objectives of the research, the methodology, the purpose of the research, target population and future directions.
- Assistance in the development of survey questionnaires for use in collecting PMSEII and HADR data for the project. This consists of the surveys that will be used by NMAA cadets in field.
- Responsibility for the uploading of survey results into a database analysis software, such as SPSS, and for the management and dissemination of that data to research partners.
- Analysis of data collected through CWP surveys. This will include a beta test of initial survey results and responsibility for refining future survey research based on that analysis. In addition, this data analysis will be cross analyzed with other databases resulted from surveys undertaken in Afghanistan.
- Production of tables and charts based on data analysis and dissemination of those tables and charts to research partners.
- Production of a White Paper and research reports based on the results of research undertaken through the CWP.

Statement of Work (SOW)
Year 1:

NSC

- Problem definition and development of research methodology for software-defined radio component. This theory development phase will be performed in conjunction with coalition partners in France. (Col. Kevin Huggins)

- Modifications made to the TIGR system for use in collecting HADR and PMSEII data. This is essentially developing the TIGR/HADR interface for the Android phones. Must be completed by July 1, 2010. (Dr. John James and Ray McGowan)

- Set-up phase for survey to be performed by cadets at the National Military Academy of Afghanistan (NMAA). Work includes two months of prep work at NMAA prior to the August break of NMAA cadets. Four cadets will collect survey data during the August break. (Dr. John James)

- Data from the August 2010 NMAA cadet survey will be moved from Afghanistan back to West Point and West Point will then transfer the unclassified version of that data to CSUSB. (Dr. John James and Dr. Frank Mabry)

- Begin process of developing a search software for TIGR. The surveys conducted at Ft. Benning will be used to help us understand what sort of information is most needed from TIGR that should be searchable. (Maj. Ian McCulloch and two cadets have started work on a search software.)

- Analysis of results of initial test surveys. Refinement of the survey and development of plan to launch a larger cadet-performed survey in August 2011. (NSC, CERDEC and CSUSB)

- Assist in the development of the survey of U.S. military personnel returning from the theater to Ft. Benning, Georgia as part of their exit process. CSUSB staff will work with West Point staff in conducting these surveys. CSUSB will host the data and take the lead in data analysis.

- Develop and oversee implementation of the ADT survey for collection of PMSEII data related to Army reconstruction efforts and information on policy and technology barriers related to information sharing. (Dan Evans and Lynndee Kemmet)

- Assist in the development of technologies that would be of use to Army missions, such as those conducted by ADTs. The technologies needed for such missions would be identified based on the ADT survey data. (Flowing Valued Information Team)

- Assist in analysis of ADT data to be used for follow-up interviews and data collection on ADT missions and challenges. (Dan Evans and Lynndee Kemmet)

CSUSB

- Assist in the development of the survey for use by cadets from the National Military Academy in Afghanistan. Must be completed by June 1, 2010.
- Assist in analysis of data collected from first-year test survey and participate in refinement of survey for use by NMAA cadets in August 2011.
- Develop data collection system and begin the process of collecting open source data on other countries. This will be the first step in a long-term data collection project. The countries on which data will be collected will be identified by the research team as those most likely to need HADR or reconstruction missions in the future. The data collected by CSUSB staff will serve as the start of future survey projects related to the CWP and ADT projects. The information to be collected will be that which is easily available and that fits into the data categories that will be developed from the NMAA and ADT surveys. In time, surveys will be undertaken to gather missing data, that is, information currently not available through open sources. The goal is to develop, at CSUSB, a large database of information containing HADR and PMSEII data that can be accessed by units engaged in future HADR and reconstruction efforts.
- Assist in the development of the survey of U.S. military personnel returning from the theater to Ft. Benning, Georgia as part of their exit process. CSUSB staff will work with West Point staff in conducting these surveys. CSUSB will host the data and take the lead in data analysis.
- Manage and assist in analysis of ADT survey data related to the collection of PMSEII data related to Army reconstruction efforts and information on policy and technology barriers related to information sharing.
- Assist in the development of policy analysis work related to information-sharing barriers identified in ADT survey data.
- Take the lead in writing and production of research papers related to the projects.

CERDEC

- CERDEC will assist in efforts to make modifications made to the TIGR system for use in collecting HADR and PMSEII data. This must be completed by July 1, 2010. CERDEC is focusing on development of TIGR/HADR interface for an Android phone – information that focuses on people, places and things. The information to be collected includes:
- What are three most important things to you?
    - Are they important, very important or the most important?

- What three government activities are most useful to you?
- What three are the least useful?
- What are the three most likely local disasters you face?
- Questions related to moving information from place to place.

- Assist in the analysis of results of initial test surveys and in the refinement of the surveys to be used in the larger cadet-performed survey to be undertaken in August 2011.
- Assist in the development of the survey of U.S. military personnel returning from the theater to Ft. Benning, Georgia as part of their exit process.
- Assist in analysis of ADT survey data related to the collection of PMSEII data related to Army reconstruction efforts and information on policy and technology barriers related to information sharing.
- Assist in the development of technologies that would be of use to Army missions, such as those conducted by ADTs. The technologies needed for such missions would be identified based on the ADT survey data.

Year 2:
NSC

- Prototype development of the software-defined radio communications tool to solve information-sharing problem identified in Year 1. This work will be undertaken in conjunction with coalition partners in France. (Col. Kevin Huggins)
- Refinement of modifications to the TIGR system for use in collecting HADR and PMSEII data based on test surveys in Year 1. (Dr. John James and Ray McGowan)
- Continue the development of a TIGR search engine.
- Expand survey undertaken by NMAA cadets to include approximately 15 Afghan provinces. This expanded survey will take place in August 2011. (Dr. John James)
- Analysis of results of larger surveys. Refinement of the survey based on those results for use in August 2012 survey. (NSC, CERDEC and CSUSB)
- Continue oversight and management of project.

CSUSB

- Continue the collection of open source data on countries deemed most likely to need future HADR and reconstruction missions.
- Manage and assist in the analysis of data collected from the joint NSC, CSUSB and CERDEC research related to these projects.
- Take the lead in analyzing the data gathered in order to identify policy barriers related to information sharing and provide guidance in eliminating those barriers.

CERDEC

- Continue to assist in making modifications to the TIGR system for use in collecting HADR and PMSEII data.
- Assist in the analysis of results of surveys.

Year 3:
NSC

- Implement prototype of the software-defined radio communications tool, which will be the architecture to connect networks and move information. This work will be undertaken in conjunction with coalition partners in France. (Col. Kevin Huggins)
- Continue the development of a TIGR search engine.
- Implement the prototype system developed during the past two years. This system should be one that the Army can take and use in theater for HADR and reconstruction missions, such as that undertaken in Haiti.
- Connect with various Army commands, such as SoCom and AfriCom, to develop other potential uses for the prototype. This may include further research on how the prototype can be easily modified to fit the different Army needs that arise.
- Continue oversight and management of project.

CSUSB

- Continue the collection of open source data on countries deemed most likely to need future HADR and reconstruction missions.
- Continue management and analysis of data collected from the joint NSC, CSUSB and CERDEC research related to these projects.
- Take the lead in analyzing the data gathered in order to identify policy barriers related to information sharing and provide guidance in eliminating those barriers.

CERDEC

- Continue to assist in making modifications to the TIGR system for use in collecting HADR and PMSEII data.
- Assist in the analysis of results of surveys.

Appendix 1:
Questions for Agribusiness Development Teams:

1. In which district does your ADT operate?

   _____

2. Does your area of operation have a Provincial Reconstruction Plan (PRP)?
    a. Yes
    b. No

3. Is the PRP being followed?
    a. Yes
    b. No

4. What is the average farm size in acres in your area of operation?
    a. 1-3
    b. 4-9
    c. 10-15
    d. 16 +

5. What is the main system of property ownership in your area of operation?
    a. Public (Government ownership)
    b. Private
    c. Communal, such as tribe

6. On a scale of 1-4, with 1 being very secure and 4 being very insecure, how secure are the rights of farmers to use of the land?
    a. 1
    b. 2
    c. 3
    d. 4

7. What are the traditional crops or livestock raised in your area of operation? (Check all that apply)
    a. Poultry
    b. Goat/Sheep
    c. Cattle
    d. Horses
    e. Other livestock
    f. Grains
    g. Fruits
    h. Vegetables
    i. Nuts
    j. Horticulture products

8. What is the use of those products?
    a. Family consumption
    b. Local/regional markets
    c. National
    d. International

9. On a scale of 1-4, with 1 being very good and 4 being very poor, how is the access to local and regional markets?
    a. 1
    b. 2
    c. 3
    d. 4

10. On a scale of 1-4, with 1 being very good and 4 being very poor, how is the access to national and international markets?
    a. 1
    b. 2
    c. 3
    d. 4

11. What would most improve market access?
    a. Road improvements
    b. Waterway improvements
    c. Improved security
    d. Changes in government policy
    e. Improved methods for marketing
    f. Improved knowledge of existing markets

12. On a scale of 1 to 4, with 1 being very concerned and 4 being very unconcerned, how concerned are Afghan farmers in your area of operation with protection of natural resources?
    a. 1
    b. 2
    c. 3
    d. 4

13. What infrastructure development projects that might improve the economic success of ADT projects?
    a. Water/irrigation systems
    b. Local markets
    c. Farm-to-market roads
    d. Farming cooperatives
    e. Other

14. What has been the traditional method by which farmers acquire livestock, feed, seeds, etc.?
    a. Barter/trade
    b. Direct purchase with cash
    c. Breed own livestock/save seeds from previous crop
    d. Private borrowing (friends, family, others)

e. Borrow from banking institution
f. Credit with seed/livestock seller
g. Marriage

15. Is there a functioning bank in your area of operation?
   a. Yes
   b. No

16. Does your area of operation have facilities for the processing of agricultural products?
   a. Yes
   b. No

17. What official entities are operating on the ground? (Mark all that apply)
   a. U.S. Department of Agriculture
   b. USAID
   c. Afghan Ministry of Agriculture, Irrigation and Livestock
   d. District level of MAIL
   e. Battlespace owner
   f. Provincial Reconstruction Teams

18. List the top three Non-Governmental Organizations operating in your area of operations.
   a. _____
   b. _____
   c. _____

19. List the main system or systems that you use to collect and share information.
   a. _____
   b. _____

20. On a scale of 1-4, 1 being good and 4 being poor, how easy is it to collect and use those systems?
   a. System a:
      i. 1
      ii. 2
      iii. 3
      iv. 4
   b. System b:
      i. 1
      ii. 2
      iii. 3
      iv. 4

21. On a scale of 1-4, 1 being good and 4 being poor, how easily can all those entities with which you work access information on those systems?
    a. System a:
        i. 1
        ii. 2
        iii. 3
        iv. 4
    b. System b:
        i. 1
        ii. 2
        iii. 3
        iv. 4

22. Are the barriers that exist for the sharing of information due to technology?
    a. Yes
    b. No

23. Are the barriers that exist to information sharing due to policies related to information sharing?
    a. Yes
    b. No

24. What are average costs of projects?
    a. Under $10,000
    b. $10,000 - $25,000
    c. $25,000 - $50,000
    d. $50,000 - $100,000
    e. More than $100,000

25. How do you track money used for projects?
    a. Paper records
    b. Computer spreadsheet
    c. Other technology

26. Who does the project work?
    a. Local Afghan civilians
    b. Afghan military
    c. U.S. military
    d. Private foreign contractors

27. How do you award contracts for that work?
    a. Put contracts to public bid
    b. Draw from a list of approved foreign contractors
    c. Draw from a list of Afghan contractors
    d. Other

28. From where does money come for projects? (Mark all that apply)
    a. CREP Funds
    b. U.S. Government Agency
    c. Afghan National Government
    d. Afghan Provincial Government
    e. Afghan Local Government
    f. Other (please list top three sources)
        i. _____
        ii. _____
        iii. _____

29. Who has the most authority at the village/district level?
    a. Tribal/village elders
    b. Locally-elected official
    c. Non-elected local individual
    d. Official appointed by the national government

30. What percentage of local/district-level funds for government services are provided by local taxes/sources?
    a. Less than 20 percent
    b. 20 - 50 percent
    c. 51 – 75 percent
    d. 76 – 100 percent

31. What percentage of local/district-level funds for government services are provided by provincial governments?
    a. Less than 20 percent
    b. 20 - 50 percent
    c. 51 – 75 percent
    d. 76 – 100 percent

32. What percentage of local/district-level funds for government services are provided by the Afghan national government?
    a. Less than 20 percent
    b. 20 - 50 percent
    c. 51 – 75 percent
    d. 76 – 100 percent

33. What percentage of local/district-level funds for government services are provided by foreign sources?
    a. Less than 20 percent
    b. 20 - 50 percent
    c. 51 – 75 percent
    d. 76 – 100 percent

34. Do you have project reports that we could view?
    a. Yes
    b. No

Appendix 11

IITPAR White Paper Draft, January 2010
GT 10102

The mission of IITPAR is to assist in improving the collection, analysis and dissemination of information, particularly through the development and deployment of new technologies, in order to save the lives of U.S. soldiers. This seems best able to be achieved by creating conditions by which U.S. soldiers can be removed from combat situations. In the case of Afghanistan, this would mean the defeat of the insurgency and the creation of a stable, functioning Afghan nation that would allow for the removal of U.S. forces.

Based on White House policy papers, it seems rather evident that the current U.S. Administration accepts this view and is focusing on a two-pronged policy approach that combines military counter-insurgency efforts with nation-building efforts. The U.S. government also seems to consider that any successful policies developed for Afghanistan may need to serve as models for future counterinsurgency efforts in other nations.

This current White House policy approach is best outlined in a June 2009 White House paper, and in updated versions, that make clear the need for joint military-civilian efforts. The June 2009 White Paper points to the need for civilian experts to assist in a broad array of nation-building efforts that include all areas of PMSEII (Political, Military, Social, Economic, Information and Infrastructure), such as the need for civilian experts to improve agricultural production and marketing; small business development; the development of sewer, water and transportation infrastructure; educational and health programs; and, very importantly, the establishment of effective local governments, which includes not only effective local government management but also fiscal health and cooperation between local and central government entities. In the words of a White House policy paper:

We need to work with the Afghan government to refocus civilian assistance and capacity-building programs on building up competent provincial and local governments where they can more directly serve the people and connect them to their government.

While White House policy papers point to the need for assistance from civilian experts and non-governmental organizations in nation-building efforts, they also express

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concerns that little data and information has been gathered that can provide insight into have effective have been current efforts. This points to a gap in assessment data. Also missing is adequate communication among the many different entities involved in nation-building projects in Afghanistan, both government entities and non-governmental organizations. As stated by White House policy analysts:

A strategic communications program must be created, made more effective, and resourced. This new strategy will have no chance of success without better civil-military coordination by U.S. agencies, a significant increase of civilian resources, and a new model of how we allocate and use these resources. For too long, U.S. and international assistance efforts in Afghanistan and Pakistan have suffered from being ill-organized and significantly under-resourced in some areas.

A large portion of development assistance ends up being spent on international consultants and overhead, and virtually no impact assessments have yet been done on our assistance programs.

Additional assistance to Afghanistan must be accompanied by concrete mechanisms to ensure greater government accountability. In a country that is 70 percent rural, and where the Taliban recruiting base is primarily among under-employed youths, a complete overhaul of our civilian assistance strategy is necessary; agricultural sector job creation is an essential first step to undercutting the appeal of al Qaeda and its allies.

This last statement above is a key concern of White House policy analysts. And indeed, where the employment situation is concerned, analysts point to a serious gap in employment information noting that accurate data on the unemployment situation in Afghanistan is lacking. Estimates place unemployment anywhere from 40 percent to 60 percent, perhaps even higher in some rural districts. It is believed that one of the keys to reducing the ability of insurgents to recruit from the Afghan population is to improve the economic and employment situation of the Afghan population and the agricultural sector is an important part of this. White House policy analysts recognize the challenge in doing this. A number of efforts are underway to convert Afghan farmers from poppy production to licit crops, but these face many challenges including lack of markets for licit crops, difficulty in transporting crops to existing markets (opium is easy to transport), and also, the fact that poppy production is relatively labor intensive, which means that switching to a crop such as wheat would mean the need for fewer agricultural workers. And that would increase unemployment in rural areas.

IITPAR Role

It is clear that the current Administration also sees Pakistan as an area of concern and the possibility that the U.S. might play a greater role in both counter-insurgency efforts and nation-building in Pakistan is not out of the question. Considering the direction of White

House policy with regard to current and long-term counter-insurgency efforts, IITPAR has the potential to insert itself into these efforts and do so within the scope of its current mission. The level of effort involved in rebuilding Iraq and Afghanistan is tremendous. Not only has a large amount of financial resources been directed to this effort, but also the number of players involved is tremendous. "Experts" from the private sector, from universities, research centers, non-governmental organizations and government agencies abound.

With so many entities jockeying for an opportunity to contribute to meeting U.S. policy goals, it raises the question of how IITPAR can position itself to stand out and contribute to the effort. There appears that White House policy analysts at times sense that too many entities are involved in rebuilding efforts resulting in confusion and duplication of effort, and at other times, there is a sense that they feel that more assistance is needed in the nation-building effort. During the October 2009 workshops at West Point, discussions were held with officers who are on the ground in Afghanistan. And those discussions pointed to two problem areas they face in civilian-military affairs: 1) a lack of expertise in local governance that would help them guide local Afghan leaders in creating effective and functioning local governments and, 2) an inability to adequately track the use and effectiveness of funds provided for rebuilding projects in the districts in which these military officers operate.

Based on a review of the current policy assessment by the U.S. government, it would seem that there are three broad areas in which IITPAR can play a role:

1. Assisting in the improvement of information-sharing and communication among the many entities involved in counter-insurgency and nation-building efforts.
2. Assisting in filling in the gaps in information and data that would contribute to nation-building efforts.
3. Assisting in the collection of information and data that can be used to assess the effectiveness of nation-building efforts.

Assisting in the improvement of information-sharing and communication among the many entities involved in counter-insurgency and nation-building efforts

To date, IITPAR has focused its efforts on identifying and removing barriers within the U.S. military acquisitions process that hinder the movement of information-sharing technologies from development to deployment. Connections made with researchers at West Point, and through West Point, indicate that there are already tremendous advances being made by researchers in developing technologies that can connect various database systems. The Coalition Warfare Project (CWP) being developed, and in which IITPAR is a participant, will work toward developing technologies that will allow for information to be transmitted across data systems of various coalition partners. Through involvement in this project, IITPAR will be able to monitor this progress and help identify and overcome policy barriers that arise as those engaged in the technology development move forward.

Hence, IITPAR's involvement in that portion of the CWP fits with IITPAR's original view of its role with regard to information-sharing technology. In addition, the collaboration with West Point's Network Science Center opens the door to another role for IITPAR with regard to information sharing. The effort by West Point researchers, led by John James, to use TIGR-U to gather data and information for humanitarian assistance/disaster recovery (HADR) and nation-building efforts, provides IITPAR with possible involvement in addressing the need for improved information-sharing and communication among the many entities involved in the nation-building effort in Afghanistan.

Discussions among those involved in the CWP have already hinted at the need to link with non-governmental organizations. Clearly, there are already many entities on the ground in Afghanistan gathering information and working on nation-building projects. Hence, IITPAR is unlikely to get much support in adding to this effort. But, IITPAR could contribute to supporting the use of systems such as TIGR-U to promote better information sharing and communication, as well as contribute guidance in how to overcome the policy barriers and "turf wars" often seen when multiple entities are engaged in similar efforts. This could be one area that provides an expanded role for CSUSB faculty and staff.

Assisting in filling in the gaps in information and data that would contribute to nation-building efforts

Although there are many parties already on the ground in Iraq and Afghanistan that are gathering information useful for nation-building programs, there are clearly still some gaps. One of the current roadblocks now being resolved with the CWP proposal is that the military, in order to support information-gathering projects such as that proposed by John James, needs a clear understanding of what information will be gathered and how that information will benefit the counter-insurgency and/or nation-building efforts of U.S. soldiers on the ground. Ray McGowan has stated that what this means is that as the CWP moves forward, and in time also the collaborative work of IITPAR and West Point's Network Science Center, information gathered through surveys or other means must be narrow and with a clear goal of filling a needed information gap. The CWP group would then build on this one piece of information at a time.

One example of an information gap is the lack of accurate data on the unemployment situation down to the province and district level. Another information gap that is hampering economic development in the agricultural sector is lack of information on rights to land ownership and use. There are a number of information gaps and the strategy for the CWP proposal in the nation-building portion of its project is to identify these gaps and fill them piece by piece. This holds out much potential for both CSUSB and West Point faculty and staff who can contribute expertise in how to develop surveys or other methods for filling these information gaps.

In addition, West Point researchers currently in Afghanistan are finding that there is quite a gap in a network approach to analyzing and linking information in a way that would provide a greater understanding of the situation on the ground. And this greater understanding through a network approach could lead to more effective counter-insurgency and nation-building policies. As researchers with West Point's Network Science Center become more involved in projects with soldiers in Afghanistan that take a network approach to information collection and analysis, opportunities will emerge for IITPAR to play a role.

Assisting in the collection of information and data that can be used to assess the effectiveness of nation-building efforts

This third area in which IITPAR could play a role seems to be the one that to date has been most ignored. Partly this may be due to the fact that many nation-building programs in Afghanistan are in their early stages, making analysis of their effectiveness somewhat premature. However, it is clear that White House policy analysts recognize a need for assessment and it is likely that Congress and the U.S. public, if not already, will soon be looking for increased assessment of the effectiveness of U.S. policies.

In particular, research already indicates a need for assessment in areas where IITPAR and CSUSB staff have been particularly strong, such as areas of governance, particularly public management and budgeting and also intergovernmental relations. There is also yet a clear need for methods that can better track development funds spent on projects. Much mention has also been made of linking some of the work of the Coalition Warfare Project to the Provincial Reconstruction Teams operating in Afghanistan. Of the 26 PRTs, 12 are headed by the U.S. The teams are a mix of military and civilian and serve as links for reconstruction efforts involving government entities, international organizations and non-government organizations. Because there are great differences among Afghan provinces, how the teams operate can vary dramatically and indications are that there is room for research that evaluates the effectiveness of the teams and their work. Currently, the effort to monitor reconstruction in Afghanistan is under the Office of the Special Inspector General for Afghanistan Reconstruction (SIGAR) and their reports are available. Based on our discussions with officers on the ground in Afghanistan, the weakness is the lack of some easy data system whereby they can keep track of reconstruction funds and projects within their areas of operation and that allow them to share this information among the various members of the PRTs. This may be another use for TIGR-U.

In sum, based on current White House policy efforts, these are the three areas in the counter-insurgency and nation-building efforts of the U.S. where IITPAR has the potential to insert itself and play a role. The link with West Point's Network Science Center will greatly enhance IITPAR's ability to contribute to these efforts and, in turn, IITPAR, through CSUSB faculty and staff, can bring to the effort individuals with expertise in such important areas as governance, public management and budgeting, survey data collection and analysis and policy development and analysis.

Appendix 12

U.S. Soldier Survey

OBJECTIVES:
- Gain an insight into the use of technology for information sharing among deployed soldiers in the field
- Understand the barriers to effective information sharing
- Gather the soldiers thoughts on possible improvements to effective information sharing
- See if there are repetitive tasks that can be automated and avoid entry duplication
- Use data to hone project goals of creating better communication technologies

SOCIAL SCIENCE METHODOLOGY:
- A random sampling of the soldiers using a random number generator
- One-on-one interview utilizing a semi-structured survey instrument
- Interview will take place soon after the soldier has returned home from deployment
- Time for interview will be approximately twenty minutes
- Information from the interview will be transcribed into the SPSS system via access by the interviewer

TIMELINE:

14 May 2010	Send draft survey from CSUSB to USMA for discussion
25-28 May 2010	Evans and Allen travel to Ft. Benning
June 2010	Schedule interview sessions for Ft. Benning and Ft. Richardson
June, July & August 2010	Conduct interviews at Ft. Benning and Ft. Richardson
September 2010	Analysis of data
October 2010	Debrief meeting and basic data analysis presented
April 2011	Present research at CSUSB workshop

SURVEY:

The Innovation and Policy Analysis Project (IPA) and Institute of Applied Research (IAR) at California State University, San Bernardino and the Network Science Center (NSC) at the United States Military Academy, West Point (USMA) are conducting a study for the U.S. Army Research Labs (ARL). We have received permission from your base commander to conduct these

interviews and the Institutional Review Board at California State University, San Bernardino, has approved the study.

The U.S. Army will use this study to inform policy on information sharing technologies. Your knowledge and use of different information sharing technologies is critical to the overall mission of the project. The survey will take approximately 20 minutes to complete and will consist of several questions which will be asked several questions in an interview setting regarding your use of different technologies for information sharing while you were deployed overseas.

Your participation in this study is voluntary and you may withdraw your participation at any time. Your refusal to participate will not involve any penalty or loss of benefits to which you would otherwise be entitled. There are no foreseeable risks or benefits to you directly as a result of your participation in this study. Any personal identifying information you share with me today will remain confidential.

If you would like additional information on the groups collaborating on this study you can check them out on the web:
- www.netscience.usma.edu
- http://iar.csusb.edu
- www.ipa.csusb.edu

By providing us with your email address, we will send you some preliminary information on the study in about four to eight weeks. If you have any questions about what we discussed, or think of additional information that you would like to share, please contact Ann Marie Allen at (909) 537-7642 or amallen@csusb.edu.

By signing below, you are agreeing to voluntarily participate in this study.

Signature: _____ Date: _____

Email Address: _____

On behalf of the IPA project, we would like to express our gratitude for your participation in this study and commend you for your service to our country.

God Bless America

1. What main systems did you use to share information?
   a. CIDNE
   b. TIGR
   c. CPOF
   d. FalconView

e. _____
2. On a scale of 1-5, with I being the easiest, how easy was it to the system?
   a. CIDNE 1 2 3 4 5
   b. TIGR 1 2 3 4 5
   c. CPOF 1 2 3 4 5
   d. FalconView 1 2 3 4 5
   e. _____ 1 2 3 4 5
3. On a scale of 1-5, with 1 being the easiest, how easily do you think the people you worked with accessed information on the system?
   a. CIDNE 1 2 3 4 5
   b. TIGR 1 2 3 4 5
   c. CPOF 1 2 3 4 5
   d. FalconView 1 2 3 4 5
   e. _____ 1 2 3 4 5
4. Which system worked the best? Why?
5. Overall, were you able to effectively share the information necessary for your mission? Please explain.
6. Did you experience and barriers to information sharing? If so, were the barriers policy, technology, organizational, cultural, or some other type of barrier?
7. If you could improve information sharing, what would you change?
8. What information did you enter repeatedly? Do you think that information could be automated?
9. Is there anything else you would like to add?
10. Can I contact you if I have more questions? If so, what is the best way to reach you in the next three months?

Demographics

1. Gender:
   a. Male
   b. Female
2. Age: ____years
3. What is your highest education level?
   a. High School Graduate (high school diploma or GED)
   b. 1 or more years of college, no degree
   c. Associate's Degree (AA, AS)
   d. Bachelor's Degree (BA, BS)
   e. Master's Degree (MA, MS, MEng, Med, MSW, MBA)
   f. Professional Degree (MD, DDS, DVM, LLB, JD)
   g. Doctoral Degree (PhD, EdD)
4. How long have you been in the military? ____years
5. What is your status?
   a. U.S. Army Active duty
   b. U.S. Army Reserve

    c. U.S. Army National Guard

6. What is your rank?
7. What is your branch?

a. Adjutant
b. ADA
c. Armor
d. Aviation
e. Chemical
f. Engineers
g. FA
h. Finance
i. Infantry
j. Medical Services
k. MI
l. MP
m. Ordnance
n. Quartermaster
o. Signal
p. SF
q. Transportation
r. Civil Affairs
s. Psychological Operations
t. Other

8. What is your MOS or career field?
9. What is your unit?
10. What is your home station?
11. How long was your most recent deployment? _____months
12. How many overseas deployments have you had in your career?
13. Where were you deployed?

a. Afghanistan
b. Iraq
c. Other_____

14. What province did you serve in?

Afghanistan

a. Badakhshan
b. Badghis
c. Baghlan
d. Balkh
e. Bamyan
f. Dehkundi
g. Farah
h. Faryab
i. Ghazni
j. Ghor
k. Heart
l. Helmand
m. Juzjan
n. Kabul
o. Kandahar
p. Kapisa
q. Khost
r. Kunar
s. Kunduz
t. Laghman
u. Logar
v. Nangarhar
w. Nimroz
x. Nooristan
y. Paktia
z. Paktika
aa. Panjshir
bb. Parwan
cc. Samangan
dd. Takhar
ee. Uruzgan
ff. Wardak
gg. Zabul

Iraq

a. Al-Anbar
b. Al-Basrah
c. Al-Muthanna
d. Al-Qadisiyyah

e.	An-Najaf	l.	Duhok
f.	Arbil	m.	Karbala
g.	As-Sulaymaniyyah	n.	Kirkuk
h.	Babil	o.	Maysan
i.	Baghdad	p.	Ninawa
j.	Dhi Qar	q.	Salah ad-Din
k.	Diyala	r.	Wasit

Appendix 13

Afghan Survey- NMAA Cadet, Staff and Faculty

OBJECTIVES:
- Set up a viable technical model for information sharing that can be applied elsewhere
- Collect Political, Military, Economic, Social, Infrastructure and Information systems (PMESII) data from the National Military Academy of Afghanistan (NMAA) cadets, staff and faculty
- Provide data to inform policy in Afghanistan for the US Army
- Get data on some of the likely future leaders of Afghanistan
- Use data as the first set in a larger database

SOCIAL SCIENCE METHODOLOGY:
- Cadet/Staff/Faculty survey will be conducted at the National Military Academy in Afghanistan
- Target population is the 3000 cadets, staff and faculty at NMAA
- A census sampling will be taken of the target population
- Survey will take approximately 20 to 30 minutes to complete
- Survey will be completed online via a computer in their native language (Dari)
- Data can be loosely applied to the Afghani population as a whole since demographic make-up of NMAA closely resembles Afghanistan

TIMELINE:

May 2010	Meet with Institute of Applied Research (IAR) to finalize draft survey (CSUSB)
1 June 2010	Cadet/Staff/Faculty survey draft send to West Point (Mrs. Allen)
8 June 2010	Finish initial version of the Cadet/Staff/Faculty survey and provide draft to translators for translation (Mrs. Allen, Dr. James)

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Mid-July 2010	Completion of the Cadet/Staff/Faculty survey (Dr. James)
Late-July 2010	Coordinate with the ISAF J-8 and the Army Corps of Engineers to identify tentative PRTs for the top four CS cadets to survey during their semester break (Dr. James)
1 September 2010	Receive cadet/staff/faculty survey data at USMA and "de-sensitize" to create an UNCLASS version of the survey data (Dr. James, Dr. Mabry, Dr. Miller and COL Huggins)
September 2010	Meet with IAR to go over initial data (CSUSB)
October 2010	Debrief meeting and basic data analysis presented (All)
October – December 2010	Prepare and publish reports on the Summer activities (All) - Lessons learned in preparing Afghanistan governance surveys - Analysis of the cadet/staff/faculty data (beginning of a longitudinal survey?) - Lessons learned in bidirectional sharing of data over a security boundary
April 2011	Reports presented at CSUSB workshop (All)

SURVEY:

You are being asked to participate in a 20 minute survey to learn more about your opinions on life in your country. The survey will cover topics such as government, security, social and infrastructure in Afghanistan. To answer a question, click on the circle or square next to the answer you want. After you answer each question, click the "next" button. If you want to change your answer, click the "back" button. You have to choose an answer for each question to move on to the next question. Please answer as honestly as you can. No one will know who you are or what your answers were. A summary of everyone's answers will be shared with people who are working in Afghanistan on social issues.

What is your position at NMAA?
- o Cadet
- o Faculty
- o Staff
- o Other _____

[IF ANSWERED OTHER ABOVE] You chose the answer other for your position at NMAA. What is your position? _____

What is your gender?
- o Male
- o Female
- o Do not want to answer

What is your age? _____

What is your ethnicity?

- o Aimak
- o Baluchi
- o Hazara
- o Kyrgyz
- o Nuristani
- o Pashtun

- o Tajik
- o Turkmen
- o Uzbek
- o Other _____
- o Do not want to answer

[IF ANSWERED OTHER ABOVE] You chose the answer other for your ethnicity. What is your ethnicity? _____

What is your marital status?

- o Married
- o Single
- o Divorced
- o Widowed
- o Do not want to answer

How many children do you have? _____

Select all the categories that describe you.

- ☐ Sunni
- ☐ Shi'a
- ☐ Hannafi
- ☐ Hanbali
- ☐ Maliki
- ☐ Shafi'i
- ☐ Ithna' Ashariya
- ☐ Ismaili
- ☐ Zaydi
- ☐ Ahmadiyya
- ☐ Alawiya
- ☐ Alevi
- ☐ Barelvi
- ☐ Bektashi
- ☐ Darqawiyya
- ☐ Deobandi
- ☐ Kubrawiya
- ☐ Mevleviya
- ☐ Naqshbandiya
- ☐ Nimatullahi
- ☐ Qadiriya
- ☐ Qalanariya

- ☐ Salifi al-ilmiyya
- ☐ Shaykhiya
- ☐ Suhrawardiya
- ☐ Tijaniya
- ☐ Uwaysi
- ☐ Yasawiya
- ☐ Other
  _____
- ☐ Do not want to answer

[IF ANSWERED OTHER ABOVE] You chose the answer other as a category. What other category describes you? _____

Which languages can you read? Choose all that apply
- ☐ Arabic
- ☐ Dari
- ☐ English
- ☐ Hindi
- ☐ Pashto
- ☐ Turki
- ☐ Urdu
- ☐ Uzbeki
- ☐ Other _____
- ☐ Do not want to answer

[IF ANSWERED OTHER ABOVE] You chose the answer other as a category. What other category describes you? _____

What province do you consider home?
- o Badakhshan
- o Badghis
- o Baghlan
- o Balkh
- o Bamyan
- o Dehkundi
- o Farah
- o Faryab
- o Ghazni
- o Ghor
- o Heart
- o Helmand
- o Juzjan
- o Kabul
- o Kandahar
- o Kapisa
- o Khost
- o Kunar
- o Kunduz
- o Laghman
- o Logar
- o Nangarhar
- o Nimroz
- o Nooristan
- o Paktia
- o Paktika
- o Panjshir
- o Parwan
- o Samangan
- o Takhar
- o Uruzgan
- o Wardak
- o Zabul

How would you describe the area your family lives?
- o Urban (city)
- o Rural (village)
- o Do not want to answer

What are the sources your family uses to get information about Afghanistan? Choose all that apply

- ☐ Religious leader
- ☐ Meetings or sermons at your Mosque
- ☐ Village chief/community leaders
- ☐ Meetings in your community
- ☐ School teacher
- ☐ Friends, family and neighbors
- ☐ Newspapers
- ☐ Magazines
- ☐ Television
- ☐ Radio
- ☐ Internet
- ☐ Text messaging (SMS) on a mobile phone
- ☐ Other _____
- ☐ No opinion
- ☐ Do not want to answer

[IF ANSWERED OTHER ABOVE] You chose the answer other as a source of information. What other sources does your family use?

_____

How often do you use these sources to get news and information about current events?

	Always	Most of the time	Sometimes	Rarely	Never	No Opinion	Do not want to answer
Religious Leader							
Meetings or sermons at your Mosque							
Village chief/community leaders							
Meetings in your community							
School teacher							
Friends, family and neighbors							
Newspapers							
Magazines							
Television							
Radio							
Internet							
Text messaging (SMS) on a mobile phone							

Overall, what do you think your life will be like 12 months from now?

- o Much better
- o Somewhat better
- o About the same
- o Somewhat worse
- o Much worse

o No opinion
o Do not want to answer

Overall, what do you think the life of your children will be like in the future compared to your own?
o Much better
o Somewhat better
o About the same
o Somewhat worse
o Much worse
o No opinion
o Do not want to answer

Think about where your family lives today. What do you think of the following?

	Excellent	Good	Fair	Poor	No Opinion	Do not want to answer
Your living conditions overall						
Security from crime and violence						
Availability of jobs or economic opportunities						
Roads, bridges and other infrastructure						
Availability of clean water						
Supply of electricity						
Availability of food						
Availability of medical care						
Local schools						
Rights of women						
Your freedom of movement or the ability to go where you wish safely						
Security from the Taliban and other armed groups						
Your ability to afford the price of things you want and need						
Support for agriculture, including the availability of seed, fertilizer and farming equipment						

Thinking again about your family's village, have any of the following been built, rebuilt, or reopened in the past year? Choose all that apply
☐ Mosque
☐ Boys' School
☐ Girls' School
☐ Health Clinic

- ☐ Government Offices
- ☐ Police Station
- ☐ Roads
- ☐ Bridges
- ☐ None
- ☐ Do not want to answer

There are various ways that a government can be set up. Choose what you think is the best option for Afghanistan at this time.

- o Strong leader where one man rules for life and has final say in all political matters
- o Islamic state where religious authorities have final say in all political matters
- o Democracy where the people can vote in elections to choose political leaders who direct political matters
- o Other _____
- o No opinion
- o Do not want to answer

[IF ANSWERED OTHER ABOVE] You chose the answer other as a type of government. What other type of government is best for Afghanistan?

_____

Regardless of the type of political system you think is best for Afghanistan, do you agree that a system of freely voting for leaders can work successfully in Afghanistan?

- o Strongly agree
- o Agree
- o Disagree
- o Strongly disagree
- o No opinion
- o Do not want to answer

Some people believe that local religious leaders should be consulted regularly on the problems facing an area while others think that politics and religion should not be mixed. What do you think?

	Always	Most of the time	Sometimes	Rarely	Never	No Opinion	Do not want to answer
Religious leaders should be consulted							
Politics and religion should not mix							

Do you agree with women in Afghanistan doing the following?

	Strongly Agree	Agree	Disagree	Strongly Disagree	No opinion	Do not want to answer
Voting						
Working outside the home						
Holding						

government office						
Getting an education						
Joining the Army						

Thinking about women wearing burkas, which statement is closer to your own opinion?

	Strongly Agree	Agree	Disagree	Strongly Disagree	No opinion	Do not want to answer
A woman should wear a burka						
A woman's father or husband should decide if she should wear a burka						
A woman should decide for herself if she should wear a burka or not						

Think about the government in your family's village. Has your family paid at least one bribe to a public official during the last 12 months?
- o Yes
- o No
- o Do not remember
- o Do not want to answer

[IF ANSWERED YES ABOVE] What were the reasons you paid the bribe? Choose all that apply
- ☐ Speed up procedure
- ☐ Make finalization of procedure possible
- ☐ Avoid payment of fine
- ☐ Reduce cost of procedures
- ☐ Receive better treatment
- ☐ Receiving information on the process
- ☐ No specific purpose
- ☐ Other_____
- ☐ Do not want to answer

[IF ANSWERED OTHER ABOVE] You chose the answer other as a reason you paid the bribe. What other reason was the bribe paid?

_____

[IF ANSWERED YES ABOVE] What type of public official was the bribe paid? Choose all that apply
- ☐ Police officers
- ☐ Municipal, provincial officers
- ☐ Judges
- ☐ Prosecutors
- ☐ Doctors
- ☐ Members of Government

- ☐ Nurses
- ☐ Cadastre officers
- ☐ Tax/revenues officers
- ☐ NGOs
- ☐ Teachers
- ☐ Customs officers
- ☐ Members of Parliaments
- ☐ Afghan Army
- ☐ Other_____
- ☐ Do not want to answer

[IF ANSWERED OTHER ABOVE] You chose the answer other as a type of public official. What other type of public official was the bribe paid?

_____

Currently, how often does your family fear for their own personal safety?
- o Always
- o Most of the time
- o Sometimes
- o Rarely
- o Never
- o No opinion
- o Do not want to answer

What do you think about this statement: "I support the presence of the following groups in Afghanistan today."

	Strongly Agree	Agree	Disagree	Strongly Disagree	No opinion	Do not want to answer
U.S. military forces						
NATO/ISAF military forces						
Jihadi fighters from other countries						
Fighters from the Taliban						
Foreign aid organizations						

Who do you hold most responsible for the violence in Afghanistan?
- o Taliban
- o Al Qaeda or foreign jihadis
- o U.S. forces
- o U.S. government
- o Local warlords
- o Drug traffickers
- o Afghan government

- o Afghan forces
- o NATO/ISAF forces
- o Other _____
- o No opinion
- o Do not want to answer

[IF ANSWERED OTHER ABOVE] You chose the answer other as responsible for the violence. Who do you hold most responsible for the violence?

_____

After that, who else do you hold responsible for the violence in Afghanistan? Choose all that apply

- ☐ Taliban
- ☐ Al Qaeda or foreign jihadis
- ☐ U.S. forces
- ☐ U.S. government
- ☐ Local warlords
- ☐ Drug traffickers
- ☐ Afghan government
- ☐ Afghan forces
- ☐ NATO/ISAF forces
- ☐ Other _____
- ☐ No opinion
- ☐ Do not want to answer

[IF ANSWERED OTHER ABOVE] You chose the answer other as responsible for the violence. Who else do you hold responsible for the violence?

_____

Over the past 12 months, do you think the Taliban in Afghanistan has:

- o Grown stronger
- o Remained about the same
- o Grown weaker
- o No opinion
- o Do not want to answer

Compared to a year ago, how has the performance of the U.S. forces changed in the following areas:

	Better	About the same	Worse	No opinion	Do not want to answer
Providing security in Afghanistan					
Avoiding civilian casualties					
Providing reconstruction and development assistance					

Compared to a year ago, how has the performance of the Afghan Army changed in the following areas:

	Better	About the same	Worse	No opinion	Do not want to answer
Providing security in Afghanistan					
Avoiding civilian casualties					
Providing reconstruction and development assistance					

Compared to a year ago, how has the performance of the NATO/ISAF forces changed and in the following areas:

	Better	About the same	Worse	No opinion	Do not want to answer
Providing security in Afghanistan					
Avoiding civilian casualties					
Providing reconstruction and development assistance					

Overall, what direction do you think Afghanistan is moving?
- o Right direction
- o Both right direction and wrong direction
- o Wrong direction
- o No opinion
- o Do not want to answer

[IF ANSWERED RIGHT DIRECTION ABOVE] Why do you think Afghanistan is moving in the right direction? _____

[IF ANSWERED BOTH RIGHT AND WRONG DIRECTION] Why do you think Afghanistan is both moving in the right and wrong direction?

_____

[IF ANSWERED WRONG DIRECTION ABOVE] Why do you think Afghanistan is moving in the wrong direction? _____

What do you think is the one most important issue in Afghanistan?
- o Economy (poverty, jobs)
- o Security (warlords, attacks, violence)
- o Weak government (corruption)
- o Reconstruction problems
- o Foreign influence
- o Education (schools, literacy)
- o Drug trade (poppy cultivation)
- o Discord (lack of unity)

o No opinion
o Do not want to answer

After that, what are other very important issues in Afghanistan? Choose all that apply
☐ Economy (poverty, jobs)
☐ Security (warlords, attacks, violence)
☐ Weak government (corruption)
☐ Reconstruction problems
☐ Foreign influence
☐ Education (schools, literacy)
☐ Drug trade (poppy cultivation)
☐ Discord (lack of unity)
☐ No opinion
☐ Do not want to answer

Overall, how would you rate the work of the following organizations?

	Excellent	Good	Fair	Poor	No opinion	Do not want to answer
National government						
Provincial government						
Police						
Afghan Army						
United States Military in Afghanistan						
United States Government (non-military) in Afghanistan						
NATO/ISAF forces						
Foreign aid organizations						
United Nations in Afghanistan						

Appendix 14

Afghan Survey – PRT Project

OBJECTIVES:
• Set up a viable technical model for information sharing that can be applied elsewhere
• Collect Humanitarian Assistance and Disaster Relief (HADR) data on Provincial Reconstruction Team (PRT) projects to learn Afghans impressions of the project
• Provide data to inform policy in Afghanistan for the US Army
• Use data as the first set in a larger database

SOCIAL SCIENCE METHODOLOGY:
• PRT survey will be conducted throughout Afghanistan

- Four cadets from NMAA will collect data on the PRT projects with a goal of collecting data on four projects with 10-12 interviews per project for a total of 160-175 responses total
- The security of each cadet will be taken care of since each PRT "do[es] not engage in combat operations; however, they retain robust force-protection capabilities that are used to facilitate [their work]"
- The cadet will utilize a Nexus Phone using the Android operating system to collect data
- A stratified sampling of certain categories will be conducted
- The survey interview will consist of approximately ten questions with the majority very short with drop down answers and other to do a short fill-in if necessary
- Instructions and training will be given via video and in-person

TIMELINE:

May 2010	2 Netgear ReadyNAS Duos and 6 Google Nexus phones purchased by CSUSB and sent to USMA at West Point (Dr. Young, Mrs. Allen)
May 2010	Meet with Institute of Applied Research (IAR) to finalize draft survey (CSUSB)
14 May 2010	PRT survey draft (Mrs. Allen)
20 May 2010	Begin a series of 6 lectures to the NMAA CS faculty on the Android Development Kit one week after arrival at NMAA (Dr. James)
20 May 2010	Finish the initial version of the PRT survey (Mrs. Allen)
27 May 2010	Complete the Android forms for collecting the PRT survey data (Dr. James, Dr. Mabry, Dr. Miller and COL Huggins)
June 2010	1 Netgear ReadyNAS Duo sent from USMA to CSUSB after programming (Dr. James, Dr. Mabry, Dr. Miller and COL Huggins)
July 2010	3 short videos sent to John James to train cadets on basic surveying techniques (Mrs. Allen)
Mid-July 2010	Provide the PRT forms as the Android development examples for the faculty seminars. Upon completion of the Android development seminars, assist the NMAA CS faculty in leading the cadets to create Dari versions of the PRT survey forms (Dr. James)
Late-July 2010	Coordinate with the ISAF J-8 and the Army Corps of Engineers to identify tentative PRTs for the top four CS cadets to survey during their semester break (Dr. James)
August 2010	Cadets take phones into the field and conduct surveys (NMAA cadets)
Mid-August	Prepare the prototype implementation for sharing the sensitive but

2010	unclassified (SBU) data between NMAA and USMA (Dr. James, Dr. Mabry, Dr. Miller and COL Huggins) - Database design and implementation for the Android phones and repositories - Implementation of a certificate authority for issuing FVI project certificates to NMAA cadets, staff and faculty - Implementation of an encryption solution for protecting the data while stored in the repositories - Implementation of the NetSMART solution for synchronizing data across a security boundary - Coordinate an Interim Authority to Test (IATT) in order to perform the FVI prototype test on the USMA NIPRnet
1 September 2010	Receive SBU PRT data at USMA and "de-sensitize" to create an UNCLASS version of the PRT data (Dr. James, Dr. Mabry, Dr. Miller and COL Huggins)
September 2010	Meet with IAR to go over initial data (CSUSB)
October 2010	Debrief meeting and basic data analysis presented (All)
October – December 2010	Prepare and publish reports on the Summer activities (All) - Lessons learned in preparing surveys for use on smart phones - Lessons learned in preparing Afghanistan governance surveys - Analysis of the PRT data (beginning of a longitudinal survey?) - Lessons learned in bidirectional sharing of data over a security boundary
April 2011	Reports presented at CSUSB workshop (All)

SURVEY:

Instructions:
Please say: "I am from the Afghan Military Academy. Can I ask you a few questions about this project?"
At the end of the survey, record a few minutes of comments for questions that need explanation or follow up.

1. What type of project?
    a. Community and government building
    b. Clinic
    c. School
    d. Radio station
    e. Gender project
    f. Agriculture project

    g. Water/irrigation project
    h. Energy project
    i. Road project
    j. Local governance building project
    k. Other

2. Do you see Afghans planning the project?
    a. Yes
    b. No
    c. Other

3. Is there local support for the project?
    a. Yes
    b. No

4. If yes, how many people in the village support this project?
    a. Most people
    b. Some people
    c. Few people

5. What groups of people in the village support the project? SELECT ALL THAT APPLY
    a. Government Leaders
    b. Religious Leaders
    c. Tribal Leaders
    d. Other

6. What groups of people in the village oppose the project? SELECT ALL THAT APPLY
    a. Government Leaders
    b. Religious Leaders
    c. Tribal Leaders
    d. Other

7. When did the project start?
    a. Last month
    b. Last six months
    c. Last year
    d. Other

8. When will the project be done?
    a. Next month
    b. Next six months
    c. Next year
    d. Other

9. Do you think this project will help your village?
    a. Yes
    b. No
    c. Other

10. Job:
    a. Tribal Chief
    b. Government Leader
    c. Mufti
    d. Farmer
    e. Teacher
    f. Other

11. Gender:
    a. Male
    b. Female

12. Age:
    (Number pad)

Record comments:

Notes from interviewer:
    (Fill in box)

"Thank you very much for your time!"

Appendix 15

Summary of Quarterly Report, Institute of Applied Research and Policy Analysis (IAR)
GT 90938

In 2008, the Institute of Applied Research (IAR) submitted a research design for a study to investigate the policy obstacles/barriers (broadly defined) that (1) hinder or prevent actionable intelligence from getting to the soldier in the field or the first responder, and/or (2) hinder or prevent the creation, development, and implementation of new technologies (especially information-sharing technologies) that have battlefield and homeland security applications. In that research design, the term "policy barriers" was initially operationally defined as anything in the rules, regulations, culture, DoD level policies, interagency policy, lower level organization and technical policies that may inhibit or prevent the creation of new

technologies or the sharing of critical information and technologies among members of the target populations.

In 2009 IAR began to implement the research design by constructing a semi-structured questionnaire designed to elicit the views of scientists and policy makers regarding policy obstacles/barriers and their suggested solutions to those barriers. In order to begin the survey, IAR received a list from Jeff Bradshaw (IHMC) of scientists and policy makers he thought would have insights into the policy obstacles/barriers described above. Dr. Clifford Young supplemented the list with additional names. In-depth telephone interviews were conducted by IAR Co-Directors with those scientists and policy makers and at the end of each telephone interview, respondents were asked to nominate additional people who could shed light on the issues under study. As a result, seventeen in-depth telephone interviews have been conducted thus far, with more scheduled during the last two weeks of January.

Appendix 16

White Paper, Institute of Applied Research and Policy Analysis (IAR)
GT 90938

White Paper: An Empirical Study of Barriers to Information Sharing
By Shel Bockman, Ph.D., Barbara Sirotnik, Ph.D. and Christen Ruiz, M.A.

INTRODUCTION

The research that underpins this white paper began in January, 2008 when Dr. Clifford Young, Principal Investigator of Innovation Policy Analysis Program, requested that the Institute of Applied Research (IAR) develop a comprehensive research design which would conceptualize a study to investigate the policy barriers that (1) hinder or prevent information from getting to the soldier in the field, and/or (2) hinder or prevent the development and implementation of new technologies (especially information-sharing technologies) that have battlefield and homeland security applications.

In September 2009 IAR began to implement the research design by interviewing a broad array of key players, both technical personnel and policy-makers, in order to identify barriers which inhibit information sharing relative to national security and our soldiers' effectiveness as warriors and nation builders. In addition, we asked the respondents to offer their own suggestions for overcoming these barriers. In this white paper we focus on the findings from those interviews which we hope will promote a

greater sharing of information so as to increase our ability to "connect the dots" relative to terrorism, tactical decision-making, and nation building.

METHODS

In order to identify barriers to information sharing and possible solutions, the initial research design called for various target populations of interest to be surveyed: scientists in Army Research Labs, outside defense contracting organizations, and other government labs; National Security Agency personnel; Army policy analysts; military intelligence groups; army lawyers; and soldiers on the ground. In-depth telephone surveys using a semi-structured questionnaire (see Appendix I) were proposed to elicit respondents' views regarding barriers and possible solutions to overcome those barriers.

It was our intent to focus initial surveys on scientists at Army Research Labs. But as the list of scientists/"technical staff" was being developed by Dr. Young and IHMC personnel, the decision was made to include other (more broadly based) target populations including policy makers and contractors. These people were contacted via e-mail to arrange a day and time for the in-depth telephone interview. At the end of each phone interview (lasting up to 50 minutes), the respondent was asked to nominate additional respondents to interview (an "open snowball technique"). This procedure continued until no new barriers were mentioned. A total of 17 interviews were conducted with key players from the following categories: Scientists, consultants, policy-makers, and high-ranking military personnel.

FINDINGS

During the in-depth phone interviews, respondents identified a variety of barriers which tended to cluster around the following major conceptual categories: (1) organizational barriers (i.e.; "human" factors), (2) technological barriers, and (3) "other" barriers to information sharing that affect the soldiers' effectiveness as warriors and nation builders. As one respondent noted, these barriers to information sharing may disappear over time as the "old culture" gives way to a new culture of the "Facebook" generation who take sharing information for granted. He commented that to these individuals, information sharing will be simply a "fact of life." But until that time comes, focus will have to be placed on more direct and pragmatic solutions to the problems/barriers. This paper reports on respondents' identified barriers and proposed solutions.

CATEGORY 1: ORGANIZATIONAL BARRIERS (I.E. "HUMAN FIREWALLS")

As might be expected, the most difficult obstacles to overcome in terms of information sharing are those associated with "organizational life." Making changes in organizational life and organizational culture are not easy. It takes leadership, understanding, and a willingness to do things differently and take risks.

The failure to share information within an organization is, of course, a problem for that particular organization. But it also has broader implications in a world where organizations do and must interact with other organizations. Indeed, the failure to share information becomes a system-wide problem with far-reaching implications. Information sharing among agencies becomes especially important when homeland security and success on the battlefield are at stake.

Virtually all respondents mentioned, at some point during the in-depth phone interview, organizational barriers ("human" factors) as major inhibitors of information sharing. One respondent put it: "The obstacles are 90% human and 10% technology." Another person disagreed, saying the obstacles are **100%** human. Whether it is 90% or 100%, the point is clear. Organizational barriers are the major obstacles to information sharing. Following are brief descriptions of some of those organizational barriers.

Organizational Barrier #1: Maintaining the status quo

All organizations seek to maintain the status quo, and the Army, NSA, contractors, and others involved with information sharing are no exception. It is understandable that organizations might wish to maintain the status quo since it offers to individuals within the organization a level of comfort, predictability and stability. On the other hand, stability is the antithesis to change relative to increasing the flow of shared information. Or in the words of one of the respondents: "There is a huge base of laws, careers, institutional identification, and politics lobbying to retain the status quo….People don't think creatively and try to change things." Or another said: "People don't want to solve the problem since they are making money on the problem."

Organizational Barrier #2: Lack of rewards for information sharing

Another barrier identified is the DoD promotion system. One respondent characterized it as: "a rigid, experiential based system. Promotions are based on combat experience, not intelligence or innovation. Often the best officers get chosen for commands which don't include combat experience. The second string people go into combat...they end up getting their promotions before the first string!" This quote is a living illustration of the classic article by Steven Kerr[3] which discusses the folly of implementing reward systems that are "fouled up" in that they reward the types of behavior the organization is trying to discourage, while the behavior desired is not being rewarded at all.

Thus, according to one respondent, one of the ways to increase information sharing is to change how the armed forces reward and promote officers. In his view, the army needs to assess capability gaps in human capital and use that as at least part of the criteria for promoting people. Currently, he noted that anyone with a

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[3] "On the folly of rewarding A, while hoping for B," *Academy of Management Executive*, 1995, 9 (1): 7 – 14.

math/science/engineering degree is at a disadvantage in the promotion system. Training in math analysis, social networks, algorithms, etc. should be built into the promotion system instead of just combat experience. In short, he noted that the armed forces need commanders making decisions who understand statistics and quantitative methods...that is, analysts who understand tactical needs.

While people are not rewarded for their technical expertise, they reportedly also are not rewarded for collaborating as part of their job. Nor are they rewarded for long-term thinking, especially considering that many "positions of power" are limited to 2 or 3 years before the person is shifted to another position. Any organizational consultant will say that criteria for rewards should reflect what is valued in the organization. That does not appear to be the case relative to collaborating and long-term thinking.

Organizational Barrier #3: Problems with dissemination of policy

Since 2001 there have been innumerable policy documents describing the strategy of DoD information sharing and providing guidelines for implementation. That notwithstanding, one respondent said: "There is no coherent plan for implementing information sharing at the top level – no vision – it is hit or miss." Whether this comment accurately reflects reality or simply one person's perspective, it is worth further investigation. At one level, there may indeed be a problem with dissemination of information sharing policy. But it is equally possible that there is simply reluctance to accept the plan, resulting in personnel actively looking for ways to avoid implementation. In addition, it may be that top-down information sharing policies may be so complex that they are not easily operationalized, particularly in light of the constant turnover of managers reported by numerous respondents.

Organizational Barrier #4: Issues of confidentiality and security

Although all of our respondents understood the need for sharing information, some voiced a concern that in the process of sharing information, confidentiality and security may be compromised. As noted by one high-level government official, "if more than 1 person knows something, it isn't a secret." On the other hand, one respondent countered this argument by pointing out that sometimes security "is a crutch people fall back on. There are technologies to solve the security problem. The real issue is a reluctance to exercise risk management." Or, as noted by one other person: "There are a lot of powerful organizations whose bread and butter it is to maintaining secrecy. I'm talking about CIA, EIA, NRO, NSA, and other 3 letter agencies that were all born out of a cold war mentality, and they ended up working against each other. This makes it difficult to connect the dots."

But if problems of secrecy were, indeed, born out of a cold war mentality, it appears that they may still be operative today. As one respondent said: "We are our own worst enemies against sharing information. For example, in the Anthrax scare of 2001, the directors panicked and didn't bother consulting CDC (Centers for Disease Control) or

others who knew what was going on. When a crisis happens, the government is not built for what should be done to share information. It is more in "protective" mode, keeping information to themselves."

No one would argue that security is a real and pressing issue. There are insider threats from foreign powers (moles) and threats from people who leak information as a way to defeat certain decisions they don't like. Yet at times measures designed to deal with security concerns have the unanticipated consequence of delaying the delivery of important information for so long that it is no longer needed. Or as one respondent phrased it: "packets of information must be encrypted in a way that it would take years to hack. But yet the information is temporal so is that really necessary? You have to interface between military units, but do it with security."

Organizational Barrier #5: Turf and personal power

Further, occasionally "people whose concern really is turf and personal power hide behind the argument of security." One respondent pointed out that it is the mindset of "If I don't share, it gives me more power within an agency." Or as another said: "If everyone has information, who gets the credit? A great technology for assessing knowledge management was developed which was 'the holy grail.' But the higher level people wouldn't 'buy' the idea because they didn't invent it themselves."

But if this general observation holds true for individuals within an organization, it also holds true in that organizations may withhold information to gain "power" over other organizations. This lack of sharing may prevent organizations which theoretically should have common interests and concerns from working together on a more broadly-based strategic picture.

Organizational Barrier #6: Different motivations for gathering and using information

Another reason for not sharing information involves agencies' different motivations for gathering and using information. For example, as one respondent observed, "if a law enforcement agency (ICE, FBI, etc) is gathering intelligence on people, it is for the purpose of arresting and prosecuting them. On the other side, DoD and Homeland Security's motivation is to gain operational advantage with their intelligence and therefore seeks to keep their information top secret." This example might also reflect a "narrow vision" in which each organization maintains its own narrow focus without taking into account how the information they possess, in combination, might have broader strategic implications.

Organizational Barrier #7: General lack of coordination and communication among agencies

A number of respondents also mentioned the general lack of coordination and communication among agencies as a major information sharing barrier. In the words of one respondent, "unless you seek out organizations yourself and find points of contact, there are few means for finding contacts across organizations and services. Our lab used to have a chief technology officer whose charge was used to keep our lab up to date on what others were doing. But since we don't have the position, there is now a terrible duplication and waste of money since agencies don't talk to each other about what each is doing." Another person said: "Mechanisms for sharing have disappeared... the last forums were held in 2003. I don't really know what happened...maybe there was a policy change?" Another person focused more on leadership turnover: "There is no communication between 4 regional commands. Every 6 months a new leader comes in, and people ignore previous datasheets and try to do something new. What that means is that there isn't an opportunity to engage in meaningful longitudinal analysis."

Organizational Barrier #8: Bureaucracy per se

Finally, bureaucracy per se with all of its attendant rules, regulations, procedures, and protocols, was also mentioned as an obstacle to information sharing. Such bureaucracy can squelch the sharing of information and the development of new ideas. This can lead to staff members feeling that their ideas don't have merit and thus are less willing to speak out when they should. They fail to present innovative ideas and solutions to existing problems. In short, people who might under different circumstances be valued resources for helping to solve the problem of information sharing may remain passive and thereby fail to present valuable insights.

CATEGORY 2: TECHNOLOGICAL BARRIERS

Technological Barrier #1: Lack of standardization

Although technology is often seen as a way of enhancing information sharing, it can also be a barrier itself. One major technological barrier is the lack of standardization of systems, and thus the lack of data compatibility between systems. One respondent quipped that telephones from different vendors work seamlessly in the everyday world. Yet that standardization does not apply to computer systems within the armed forces and the Department of Homeland Security. Several respondents talked about the lack of interoperability of stovepipe systems which were originally developed to stand alone and solve a specific problem. Such a standalone system does not easily allow for analysis of data across multiple sources and domains.

One respondent suggested that one way of creating a more seamless system is to develop a core network system propagating down to the state level, in which different services agree to go through a core network for their communications. He recognized that getting the different organizations to agree to use the same networks is not an easy task since each organization has its own separate culture, argot, languages, turf battles, etc.

Technological Barrier #2: Protecting the source

Another technological problem has to do with the challenge of sharing data which are unique in structure and detail, thus making it difficult to protect the source. In an effort to maintain security, there are typically efforts to make the information "anonymous" (which may or may not be successful given the extreme uniqueness of some types of information) or to share only part of the data (thus diminishing the utility of the information).

One solution offered was entity mapping which basically "fuses" data at the highest level. When the map is shared, people who hold disjointed pieces of information are able to see where other connecting pieces might be found. Thus entity maps may help solve the problem of people within agencies who don't share information due to a "limited vision" which doesn't allow them to recognize that some of the information they have might be extremely useful to another agency (although not directly actionable for them,). Further, the entity mapping concept may have implications that go beyond tying discrete bits of data together into a coherent integrated package. Indeed, entity maps may serve the purpose of helping people within and among agencies develop trust, recognize long-run mutual interests, and "see the big picture." The applications in a nation-building context are clear.

Technological Barrier #3: Speed of the acquisition process

The speed (or lack thereof) of the acquisition process is perceived as another barrier. It has been estimated that the average length of time for technology procurement is between 3 and 10 years (depending on the complexity of the technology). This means that much of the technology having to do with collaborative efforts is outdated before it can be fielded. Respondents reported that "it is hard to get a decision made on adopting new technology and moving it into operational use. It takes extensive testing of the technology, testing of competing projects, and a look at every possible criticism before the final acquisition can be done. That lengthy acquisition process may work well when building large complex equipment that doesn't have a limited life span (e.g. jets, carriers, tanks....). But when working with information technology which changes on a monthly basis (and can change generations in 12 months), a 3 year planning horizon simply doesn't work."

What is the solution to this problem? For one respondent, the answer is straightforward: simply circumvent the typical lengthy acquisition process. Specifically, he cited the TIGR system as a case in point. Reportedly, the fact that it was left in DARPA (and thus out of the acquisition process) allowed for faster development, at the same time allowing developers to tap into the creativity of the soldiers at the squad and platoon levels who used TIGR as a collaborate tool.

Technological Barrier #4: Feedback to developers about technologies

The scientists interviewed generally agreed that they don't get enough feedback about what the soldiers need and want relative to the types and functionality of technology needed. As one respondent said: "We don't know what the soldiers want. The *soldiers* don't know what they want. They can't imagine the technology available. So it's a chicken and egg problem."

Scientists conjectured that it is a problem which might be easily solved by simply employing an ongoing monitoring/feedback process which not only would allow the scientist to receive information on how well their technologies are working, but also would provide to those scientists more insight into the soldiers' unmet needs.[4]

Technological Barrier #5: Information overload

Finally, according to some of our respondents, their organization is dealing with "information overload" due to the fact that they are increasingly dealing with massive amounts of data. It takes time with the current "funneling" tools to convert the data to information (data in context), and information to meaningful intelligence.

The respondents noted that there are several companies working on technologies which will help solve the problem. Examples include SAFFRON's associate memory technology which emulates human funneling so that people can "read everything without reading everything" or Truviso which is working on "rethinking" how databases operate. Instead of putting information into a passive repository in which data is "lost," a process called "continuous analytics" is used to process data as it arrives and allow for relevant real time queries "on the fly."

CATEGORY 3: "OTHER" BARRIERS TO INFORMATION SHARING THAT AFFECT THE SOLDIERS' EFFECTIVENESS AS WARRIORS AND NATION BUILDERS

The term "nation-builders" rolls off the tongue easily, however what is truly meant by the term? A review of the literature suggests that nation-building has a variety of definitions depending on who is doing the defining. For example, a 2003 study by James Dobbins and others for the RAND Corporation defines nation-building as "the use of the armed forces in the aftermath of a conflict to underpin an enduring transition to democracy." Other definitions avoid the term "democracy" and instead simply stress that nation-building is the creation of a "stable society" that will not be a threat to their neighbors. Regardless of which definition one chooses to accept, information sharing is needed to succeed in the daunting task of nation-building.

"Other" Barrier #1: Difficulties of information sharing among coalition partners

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[4] During the April 6 – 9, 2010 workshop in Indian Wells, Ca., IAR will be interviewing soldiers who have recently returned from Afghanistan or Iraq in an effort to determine their unmet information needs.

Information sharing is especially difficult between coalition partners who have different policies on sharing. Some units (e.g. UK) have to get permission to share. In contrast, the DoD has a policy indicating that commanders at any level can simply declare a need to share information and do it. And what makes it even more complicated is that, according to one respondent, commanders are not always aware of that fact. His suggestion is to send liaison officers who can talk to the separate commands and to identify disconnects in policy between all coalition partners.

He also suggested that perhaps liaison officers could also be used to connect "untraditional" sources of information (e.g. Doctors Without Borders, USAID, World Food Organization, Red Cross, etc.). As he noted, "those organizations have a better perspective on what's going on, yet they often don't share information! Why? Because operationally they don't have the requirement to share it, so they don't. Further, they use the US military for protection and cover, but they can't appear too close and lose their anonymity. They must remain separate and distinct. So information share is difficult. There is no systematic strategic vision for nation-building."

"Other" Barrier #2: Soldiers lack the necessary training to be effective in their nation-building efforts

As some of our respondents pointed out, proper training of soldiers consists of the transfer of information from one person/entity to another. Lack of sufficient training (i.e. barriers to information flow) can have a direct and immediate impact on our soldiers' ability to engage in effective nation building.

As one respondent pointed out, there hasn't been a well defined strategy for nation building since the end of WWII. During WWII the strategy of nation building was defined in terms of specific roles -- the fighters did their jobs, the battle ended, and then the State Department came in to do the job of nation building. But since that time wars have become more complicated since there are no longer well-defined victories after which nation-building can begin. In Iraq there are still flare-ups of violence, so the soldiers end up switching back and forth between soldier role and nation-builder role which includes the everyday concerns of SWET (Sewage, Water, Electricity, and Telecommunications). Soldiers are placed in the position of trying to fix the quality of life for foreign cultures, yet they have not had the necessary training, background, or current information to do so. Simply put, in the 21st century, a soldier's job is not only to fight the war but also to win the "hearts and minds" through nation-building. Yet reportedly the soldiers are not well prepared for that dual role.

SUMMARY AND CONCLUDING COMMENTS

Throughout this paper, we have presented our respondents' views regarding barriers to information sharing as well as their possible solutions for overcoming such barriers. Most important organizational barriers identified include: a desire to maintain

the status quo, lack of rewards for information sharing in the promotion system, using confidentiality and security as an excuse to avoid information sharing, attempts to maintain turf and personal power, general lack of coordination among agencies, and the bureaucratic organizational structure of DoD and armed forces. Of course, technological barriers were mentioned as well, particularly a lack of standardization , an acquisition process that works at glacial speeds, and the difficult process of funneling huge amounts of data and converting it to meaningful intelligence.

When we take a step back in order to put our findings into perspective, one thing is clear: the majority of respondents agreed that 21st century technology will increasingly provide technological solutions to the problems of information sharing, but these solutions will be less than optimal unless the organizational barriers articulated in this paper are addressed. Moreover the challenge is determining ways to fashion effective pragmatic operational solutions to the organizational barriers. In other words, "the devil is in the details."

With that said, we offer the following "next steps" for future research:

1)   IAR has received a great deal of useful information in the interviews reported in this paper, however additional interviews would be fruitful to expand upon the solutions already offered. That process will begin at the April 6 – 9 workshop when information sharing barriers will be discussed with soldiers and policy-makers attending the workshop. Additional interviews as well as a Delphi process will also be undertaken in the months to come.

2)   As virtually all respondents agreed, it is easy to provide solutions, but it is now time to begin the difficult and serious effort to operationalize those solutions. Simply consider the suggestion to change the promotion system so as to reward people for sharing information. Such a call for change is easily verbalized, however creating and implementing actual performance measures that are fair and equitable and that will succeed in changing behavior relative to sharing information is another matter.

Even more difficult to implement would be solutions which involve more extensive organizational design issues. For example, as is well known in the social science literature, pyramidal (i.e. bureaucratic/ hierarchical) design is itself a structure that inhibits information sharing. Such a structure is based on secrecy, turf, the power of authority over ideas, and the hesitancy to share information. In fact some would argue that this design that was initially invented 5,000 years ago has lost its utility (especially in knowledge based organizations). Instead, within 21st century professional organizations, power and authority give way to the best ideas. Secrecy gives way to the "need to share and know." And security and turf issues give way to a common vision.

Neither we nor our respondents would suggest totally breaking down the pyramidal structure currently employed. Respondents, however, did note the possibility of incorporating trans-located individuals within each agency (i.e. "purple staff") whose

job it is to bridge the gap among organizations in order to keep each service/agency up to date on what other agencies are doing. Such "connector points" therefore begin to transform the organizational pyramid into a more open organizational system in which organizations have a systemic connection, one to another. This holds promise of breaking down some of the organizational barriers to information sharing that have been articulated in this white paper. This notion of connectors also applies to nation-building efforts. Simply put, connectors could be embedded within tactical units so that fighters trained for tactical missions could do their jobs while the connectors could focus on nation-building. Again, how to operationalize this concept is an area for future research.

In his article "Leading Change," John Cotter discussed the importance of creating short-term ("quick") wins in order to promote and sustain organizational change. We believe that the future research called for in this paper will provide ways to create such quick wins which will result in long-term improvements to information sharing among the DoD and armed forces.

APPENDIX I

Copy of Questionnaire

QUESTIONNAIRE FOR SCIENTISTS/POLICY MAKERS

Name: _
Title: _
Lab: _
Phone:_

1)   Briefly, how does your job relate to information-sharing technologies?

2)   From your vantage point, what do you see as the major obstacles to information sharing?

3)   From your point of view, what are the policy solutions to the barriers you've mentioned?

4)   Some people I've interviewed have already mentioned certain barriers. To make sure we've covered all possible obstacles that you face, I'm going to read a list. Please rate each on a scale from 1 to 10, where 1 is "not a barrier" to 10 is "a significant barrier."
        a)   A long and complicated acquisition process
        b)   Pressure to increase speed of technology development
        c)   Not enough time or funding for basic science research
        d)   Insufficient information about what the soldiers and commanders need in battlefield and homeland security situations

e)   Lack of interagency communication

f)   Lack of coordination among agencies

g)   Lack of collaboration, meaning actual thinking and working together on problems, among agencies

h)   Too much security

i)   Too many legal hurdles

j)   General communication problems in the organization

5)   Do you have any ideas about solutions to the barriers you just mentioned?

6)   Once you have developed your new technology, do you ever know what has happened to it down the line? Would it be helpful to you to get that feedback?

7)   We know that it is sometimes difficult to measure scientific progress. What do you think are the critical indicators that would show that you and your colleagues are doing a good job?

8)   For our records, how many years of experience have you had in this field?

9)   Just in case we need to contact you for clarification of one of your answers, could I please have your Email address?

10)   Last question: is there anyone else you can think of that you suggest we call to get input on the issues we've just talked about?

Appendix 17

Progress Report Covering IAR Activities, April 1 to June 30, 2010
GT 10162

In 2008, the Institute of Applied Research (IAR) formulated a research design for a study to investigate the policy obstacles/barriers (broadly defined) that (1) hinder or prevent actionable intelligence from getting to the soldier in the field or the first responder, and/or (2) hinder or prevent the creation, development, and implementation of new technologies (especially information-sharing technologies) that have battlefield and homeland security applications. In that research design, the term "policy barriers" was initially operationally defined broadly as anything in the rules, regulations, culture, DoD level policies, interagency policy, lower level organization and technical policies (DoD Directive, Petraeus, 2006) that may inhibit or prevent the creation of new technologies or the sharing of critical information and technologies among members of the target populations.

In 2009 IAR interviewed scientists and policy makers who were nominated based on insights they may have into the policy obstacles/barriers described above. IAR wrote a "white paper" summarizing the findings of these interviews which was presented at the April 2010 workshop in Indian Wells. During the presentation participants (scientists, policy-makers, and soldiers who had recently returned from Afghanistan) were asked to comment on the validity of the paper's findings and to provide additional insights from their varied perspectives.

Also under Agreement GT 10162, IAR constructed a questionnaire and conducted personal interviews with the available soldiers at the April 6 – April 9 conference. The purpose of those interviews was to determine soldiers' views on barriers to information sharing and possible solutions. We are in the process of compiling the results of those interviews. These results will be disseminated to scientists and policy makers using a Delphi technique to gain feedback regarding the soldier's perspectives. All findings from the initial interviews, workshop feedback, and Delphi will be incorporated into the initial white paper in the near future and some of the findings will be presented at future workshops/meetings.

Appendix 18

IHMC Progress Report to CSUSB, May 1, 2009 – July 31, 2009
GT 10101

The IHMC technical development aspect of this project performed the following tasks during this period:

1. Gathering requirements for integration with current and near future field systems
2. Designing and implementing extensions to the current prototype software

The objectives of the requirements gathering task are to gain a better understanding of the Intel analysis workflow and current analyst toolset and to identify capability gaps that may be filled through the technology developed for this project.

- May 26 - 27. IHMC hosted a meeting with key CERDEC and CSUSB personnel.
- July 24. Attended meetings with CERDEC, CSUSB, and HRED at the Ft. Huachuca Intel School
- Preparations for the Aug 3 - 4 meetings with CERDEC and CSUSB at the West Point Military Academy to interview Soldiers concerning the TiGR system.

IHMC has been working with ARL Aberdeen to replace the static repository of available Intel in the demonstration software with Intel dynamically provided via services from the Agile Computing middleware.

- Setup and studied a client-server demonstration system provided by our ARL Aberdeen collaborators based on the legacy services used by ARL Adelphi including the Tactical Object Service (TOS), Sensed Object Service (SOS), and Media Object Service (MOS).
- Studied the distributed Agile Computing services that will replace the TOS, SOS, MOS services and obtained source code for integration.
- Designed the integration strategy for representing and enforcing KAoS policy to govern information sharing through the Agile Computing Dissemination Service (DisService).
- Implemented KAoS policy integration with the DisService.

Next Milestone: Sept. 30 initial extended prototype software release to ARL Aberdeen.

Now that we are able to apply information sharing policies in the DisService, the next steps involve visualizing data flowing through the DisService combined with the policies that govern its sharing, and subscriptions to DisService information based on the attributes of the mission obtained from operations orders.

In anticipation of the January '10 workshop on information sharing, Paul Feltovich examined the main documents that initiated the "information sharing" movement within DoD and the intelligence community. These included documents from DoD itself, for example the "Information Sharing Strategy" and the "Information Sharing Implementation Plan." These portray both the visions and rationale for sharing and specific goal and metrics to be used to measure success of implementation. Documents emanating from the DNI serve similar function for the intelligence community. This initial document study provides guidance for deeper inquiry, in the next quarter, for investigation of progress in relation to visions and milestones contained within the originating documents.

In anticipation of Cognitive Work analysis opportunities with intelligence operatives, aimed at discovering policy barriers to effective intelligence work, Paul and Jeff designed a cognitive and work analysis plan for extended interactions with S2 level intelligence officers in realistic settings of work. In anticipation of future cognitive work analysis sessions with Army staff, we made preparations for an Aug. 12-13 meeting with professional intelligence analysts on visualization, collaboration, and software agent assistant requirements for analyst support.

Issues to work

1. Need to set up a teleconference with Mark Thomas and others at Aberdeen to confirm plans for September deliverable.
2. Need to confirm agenda and plans for October workshop at West Point
3. Need to confirm dates and agenda for January workshop
4. Need to finalize SOW for Paul Feltovich
5. Need to find new dates for visit of Capt. Bernard to IHMC
6. Need access to TiGR software and data

Appendix 19

IHMC Progress Report to CSUSB, August 1, 2009 – October 31, 2009
GT 10101

The IHMC technical development aspect of this project performed the following tasks during this period:

1. Continued gathering requirements for integration with current and near future field systems
2. Development of an appropriate scenario based on previous meetings
3. Designing and implementing extensions to the current prototype software in support of the new scenario.

Building on our previous interactions at the ADA Workshop and at Ft. Huachuca, we developed a new tactically-focused scenario focusing on providing complementary technologies to TiGR (Tactical Ground Reporting) and similar tools. Our approach supports real-time sharing of locally relevant intelligence in a policy-aware manner that we feel can significantly improve the retrieval and sharing of information vital to the warfighter.

A demonstration was developed to highlight several of the capabilities we believe are essential to data gathering and dissemination in tactical environments. The demonstration relied on IHMC technologies developed during the course of the ARL ADA effort, including enhancements to the KAoS Policy Services Framework to provide policy-based data replication, prioritization and filtering, in conjunction with new developments in the Dissemination Service of the Agile Computing Framework. We demonstrated dynamically acquiring cached local information from adjacent sensors and units upon the arrival of a new unit to the operating area. We also demonstrated sharing new live information generated while in contact. We demonstrate policy management over publishing certain data as well as access to the data, making sure only the appropriate entities receive the information.

We participated in the West Point-sponsored Network Sciences and TiGR workshops (26 - 29 October). At this workshop we talked to recently returned soldiers and confirmed that there is a lack of real-time sharing of locally relevant intelligence. We also had the initial demonstration available for viewing.

Next Milestone: January 31
We will extend the demonstration to include using policies to limit high bandwidth tasks, such as retrieving high-resolution images. We will also work toward adding data filtering within the dissemination service to provide real-time adjustment of message priority to ensure the most important messages receive priority within the limited bandwidth. We will also continue to develop and improved visualization of sensor data and reports. We will provide our demonstration code to ARL Aberdeen and ensure it works on their machines.

Development of Institute for Human and Machine Cognition (IHMC) technology demonstration model will continue with presentations at the U.S. Army Research Laboratory (ARL) and IEEE conferences.

Captain Joseph Bernard visited IHMC in Pensacola, Florida to discuss Tactical Ground Reporting (TiGR) System on October 12, 2009.

Appendix 20

IHMC Progress Report to CSUSB, November 1, 2009 – January 31, 2010
GT10101

The IHMC technical development aspect of this project performed the following tasks during this period:

1. Implemented policy management of information retrieval within Dissemination Service
2. Implemented policy management of data prioritization within Dissemination Service
3. Hosted ARL at IHMC and installed working demo on their machines

We continued refining our tactically-focused scenario focusing on providing complementary technologies to TiGR (Tactical Ground Reporting) and similar tools. Our refinements have been supported by several people who recently returned from either Iraq or Afghanistan. They have expressed much enthusiasm for the direction our project is headed. Our approach supports real-time sharing of locally relevant intelligence in a policy-aware manner that we feel can significantly improve the retrieval and sharing of information vital to the warfighter.

Our demonstration was developed to highlight several of the capabilities we believe are essential to data gathering and dissemination in tactical environments. The demonstration relied on IHMC technologies developed during the course of the ARL ADA effort, including enhancements to the KAoS Policy Services Framework in conjunction with new developments in the Dissemination Service of the Agile Computing Framework. We previously demonstrated dynamically acquiring cached local information and sharing new live information, as well as policy management over publishing certain data. We extended our demonstration to include using policies to limit high bandwidth tasks, such as retrieving high-resolution images. We will also added data prioritization within the dissemination service to provide real-time adjustment of message priority via KAoS policies to ensure the most important messages receive priority within the limited bandwidth. We continued to develop and improved visualization of sensor data and reports.

We hosted ARL at IHMC and installed and tested the demonstration on each of their machines.

Next Milestone:
April workshop presentation and video

Appendix 21

IHMC Final Report to CSUSB, May 1, 2009 – April 30, 2010
GT10101

The final project is a culmination of the work developed during this project. The final white paper and video both demonstrate our technologies and point a direction for future work. These are provided on a DVD which has been mailed and can be accessed on our website:
http://www.ihmc.us/users/mjohnson/projects/CSUSB/downloads.html

The IHMC technical development aspect of this project performed the following tasks during this period:

1. Gathered requirements for integration with current and near future field systems.
2. Setup and studied a client-server demonstration system provided by our ARL Aberdeen collaborators based on the legacy services used by ARL Adelphi including the Tactical Object Service (TOS), Sensed Object Service (SOS), and Media Object Service (MOS).

3. Designed and implemented an integration strategy for representing and enforcing KAoS policy to govern information sharing through the Agile Computing Dissemination Service (DisService) including:
   a. Information publishing
   b. Information retrieval
   c. And Data Prioritization
4. Developed several scenarios to demonstrate integration of KAoS policy framework and DisService in support of various Army missions, including a highly realistic scenario based on requirements gathering efforts with numerous soldiers.
5. Designed and implemented extensions to the current prototype software in support of the new scenario including visualizations.
6. Developed information gathering and sharing plan that is simple for the soldier in the field to use and yet potentially powerful for information query and association
7. Implemented prototype handheld device to demonstrate feasibility
8. Presented the concept white paper, a video of the full scenario and a live demonstration of the prototype handheld device at IPAP workshop.

We participated in the following meetings:

- May 26 - 27: IHMC hosted a meeting with key CERDEC and CSUSB personnel.
- July 22 - 23: ADA workshop in D.C.
- July 24: Attended meetings with CERDEC, CSUSB, and HRED at the Ft. Huachuca Intel School.
- Aug 3 - 4: meetings with CERDEC and CSUSB at the West Point Military Academy to interview Soldiers concerning the TiGR system.
- 26 - 29 October: West Point-sponsored Network Sciences and TiGR workshops
- December 16: Hosted ARL at IHMC to provide code and assist in installation and configuration.
- April 6 - 9: presented at the IPAP workshop in Indian Wells.

We gathered requirements and gained a better understanding of the Intel analysis workflow and current analyst toolset through a variety of meetings and connections made during this project. This included the Ft. Huachuca visit and the Tiger workshop where we were able to meet with several soldiers recently back from Iraq. We also coordinated with Eric Heilman from ARL and Joe Bernard and Eric Roles who have both had several tours in Iraq and Afghanistan. These resources helped us identify capability gaps that could be filled through the technology developed for this project. Building on our previous interactions at the ADA Workshop and at Ft. Huachuca, we developed a new tactically-focused scenario focusing on providing complementary technologies to TiGR (Tactical Ground Reporting) and similar tools. Our approach supports real-time sharing of locally

relevant intelligence in a policy-aware manner that we feel can significantly improve the retrieval and sharing of information vital to the warfighter.

Our demonstration was developed to highlight several of the capabilities we believe are essential to data gathering and dissemination in tactical environments. The demonstration relied on IHMC technologies developed during the course of the ARL ADA effort, including enhancements to the KAoS Policy Services Framework in conjunction with new developments in the Dissemination Service of the Agile Computing Framework. We demonstrated dynamically acquiring cached local information and sharing new live information, as well as policy management over publishing certain data. We also demonstrated using policies to limit high bandwidth tasks, such as retrieving high-resolution images and added data prioritization within the dissemination service to provide real-time adjustment of message priority via KAoS policies to ensure the most important messages receive priority within the limited bandwidth.

In December, we hosted ARL at IHMC and installed and tested the demonstration on each of their machines. We have also provided a software update to them based on the latest scenario.

We presented a white paper at the IPAP workshop that describes our vision for future intelligence gathering and sharing. It was specifically focused on helping the soldier in the field working at the tactical edge. The paper was well received by all soldiers in attendance at the workshop. We also presented a video demonstrating our technologies. We concluded with a live demonstration of a prototype handheld device enabled by the technologies we have developed during the project.

Appendix 22

IHMC concept map for the April 6 - 9, 2010 IITPAR workshop brainstorm session on semantic tagging
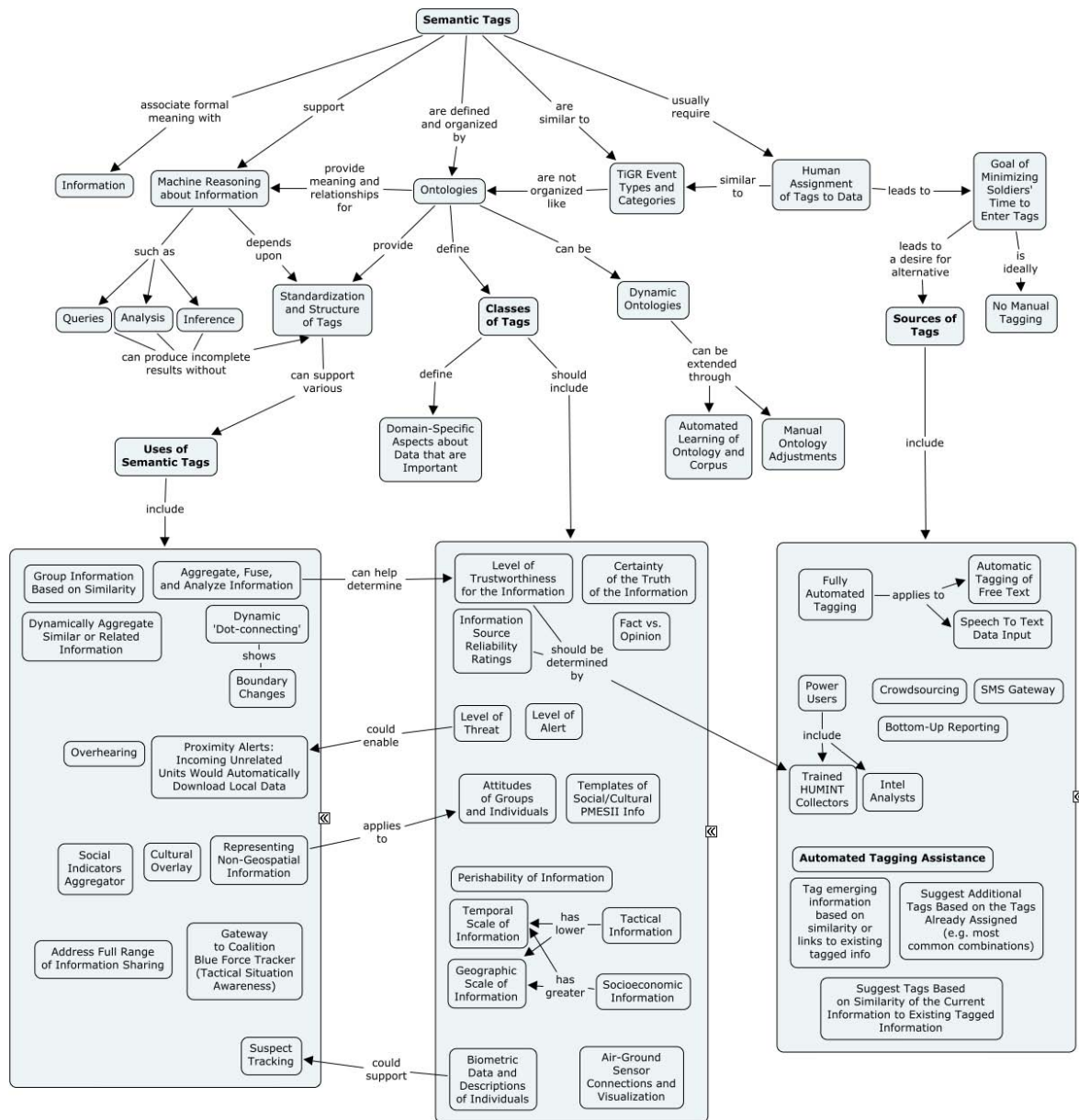
Appendix 23

Network Science Center/IITPAR at CSUSB Meeting at USMA September 16, 2009

Action Items:

- Continue development of survey of cadet applicants at National Military Academy of Afghanistan (NMAA) in Afghanistan. Consider the possibility of administering the survey to current cadets at NMAA this year and use those results for a report for the June Leaders Conference. Those survey results could then also serve as a guideline for refining the survey with the aim of administering it in the fall of 2010 to applicants at NMAA.

    o CSUSB has purchased survey software and prior to the October 26 - 30 TiGR and Network Science conference, CSUSB staff will work to master the survey software.
    o Upcoming deadlines:
        ▪ Comments on survey to Ms. Ambreen Rehman by September 24.
        ▪ October 8 - the survey instrument will be ready for all parties to review.
        ▪ October 26 - the survey will be ready for a pre-test of USMA cadets. Cadets will also be chosen to act as interpreters and to input the survey answers.
        ▪ Within the time frame, we must discover how much time it will take to have the survey translated and ready for execution in Afghanistan.

- Additional questions to consider in the survey:
    o An effort to understand the source of power at the local level (Afghan system runs from family to tribe to local officials to district and then to province). Possible questions include:
        ▪ Who would you ask for assistance if looking for a job or trying to start a business?
        ▪ Who assisted you in the last natural disaster?

Appendix 24

COALITION WARFARE PROPOSAL – FY10-11
Sharing Valued Information in a Coalition Context
GT 10102
February 1, 2010

ANNEX A: EXECUTIVE SUMMARY: Sharing Valued Information in a Coalition Context

Lead Sponsor: US Army (USMA)   Foreign Partners: France,GIROA
Supporting Sponsors: CENTCOM

COALITION WARFARE PROPOSAL – FY10-11

i. Executive Summary
Proposal Title

Sharing Valued Information in a Coalition Context

Overview

Abstract:

- **How did project get started?**

The project began as an outgrowth of existing cadet and faculty research and development efforts with a variety of institutions. The proposed project will leverage prior and current cadet and faculty efforts with the Command and Control Directorate of the Communications-Electronics Research, Development and Engineering Center (C2D CERDEC), with the École Nationale Supérieure de Techniques Avancées (ENSTA) in Paris, France, and with the National Military Academy of Afghanistan (NMAA) in Kabul, Afghanistan, and California State University at San Bernardino (CSUSB). The Network Science Center is working with C2D CERDEC, ENSTA, and NMAA to submit a proposal under the CWP to perform technology transfer of recent results. We currently expect to have approximately $700K/year of matching effort by potential participants for a two year project.

- **Did this initiative start as an international effort, or are you adding one or more coalition partners to what either is or would be a US-only project?**

Yes, this initiative began as the result of a direct engagement between the USMA faculty acting as mentors at the National Military Academy of Afghanistan (NMAA) and faculty working in Paris under the Engineer and Scientist Exchange Program (ESEP)

- **Is this part of a JCTD? If so, define the portion of the project that is the specific request for CW funding.**

This is not part of a JCTD.

- **Is this a Foreign Comparative Testing candidate?**

This is not a Foreign Comparative Testing candidate.

- **Is there a web site available for OSD to learn more about your initiative? if so, provide URL.**

The West Point Network Science Center website, http://www.netscience.usma.edu contains overviews of the Center projects including the project whose technical results will be transitioned through CERDEC under the proposed project. The Flowing Valued Information (FVI) project has been discussed at the Network Science Workshops linked form the Center website and the FVI reports and overview provide more information on project goals and results.

Objective:

- **What are the objectives of the project?**

The primary objective of this project is to demonstrate the technical feasibility of providing automation assistance to commanders in executing a command decision to share information.

The current inability to automatically share information has recently been highlighted, http://www.cnas.org/node/3924, by the senior intelligence officer at the International Security Assistance Force (ISAF) Afghanistan, MG Flynn, as an issue in achieving his goal of "… sweeping changes to the way the intelligence community thinks about itself – from a focus on the enemy to a focus on the people of Afghanistan…"

- **Include a description of the technology or other innovation being pursued to either develop or improve coalition interoperability.**

The proposed Coalition Warfare Project (CWP) has as its nucleus an unclassified information sharing network using the Unclassified Tactical Ground Reporting

(TIGR-U) system between USMA (West Point) and National Military Academy of Afghanistan (NMAA) in Afghanistan. The core goal of this project is to enable the collection and sharing of PMSEII (Political, Military, Social, Economic, Information and Infrastructure) data focusing on social cultural information to assist with the task of "Building the Network" in Afghanistan. There are four key technical efforts needed to enable this project and one over-arching theme dealing with policy impacts on information sharing that cuts across the individual efforts.

The core of the effort is achieving technology transition of the Flowing Valued Information (FVI) project result for moving information across a security boundary in accordance with a commander's decision to share the information. The implementation of automation support for a commander's declaration of a policy of a "need-to-share" a given set of information elements will leverage existing TIGR-U network nodes at USMA and NMAA to flow information between these nodes. Ideally, we will demonstrate extending this core information network result to include, at least, a third-nation to create a more complex information sharing and policy environment to evaluate both flowing valued information and policy based management technologies that are being developed at USMA and US/UK ITA, respectively. The method that will be used to accomplish the data collection is to provide a select group of NMAA cadets and equip then with the TIGR-U application on a laptop and potentially on an I-Phone or an Android phone. During their semester break, the cadets will use the systems to collect information at a Provincial Reconstruction Site near their home. In the simplest implementation, the cadet will not have connectivity with NMAA and would collect the information on site, store the data locally and upload the data to the NMAA network upon there return to the academy.

The second research component of this effort is to determine what information needs to be collected in theater. This research area will be lead by Major Ian McCulloh and Mr. Guy Filippelli. In discussions with Lt. Cole, one the soldiers on the panel during day two of the recent West Point TIGR Users Workshop, he clearly stated that one of the core responsibilities of a tactical commander in Afghanistan was to manage SWEAT (Sewer, Water, Electric and Telecommunications infrastructures) concerns within their Area of Responsibility (AOR) by attending local and regional town hall meetings and other meetings with local/tribal/religious leaders as a means of understanding how US, Coalition and NGO actions and activities are developing, and also how they are being perceived by the populace. The HADR (Human Assistance/Disaster Recovery) interface will be the primary interface on TIGR-U for the Afghan cadets to use for collection. Lt. Cole stated that the identified information in HADR interface was useful but to add value for the tactical commanders on the ground more coordinated and synergistic information gathering strategy will be required. The proposed data to be collected by the NMAA cadets will both enable successful completion of warfighter HADR missions and also assist in answering the questions posed by MG Flynn for ISAF intelligence officers in "…understanding the population. .." There is currently a critical capability gap in

sharing relevant information with individuals who are usually not "on the net" (i.e. Afghanistan ANA and ANP officers, local government officials, local non-government organizations,…). The proposed effort will enables meeting this existing warfighter capability/information shortfall.

The third research component which is a critical component of supporting timely information sharing is exploring the use of software defined radios to enable near-real time data exchange for the cadets while they are in the field collecting information. The initial data collection efforts will occur with the cadet capturing various input: still imagery, videos, audio files (interviews), GPS data, etc. and storing it locally on either the Android phone, the I-Phone or the TIGR laptop with their annotations as part of the TIGR-U report. In theory, enabling the TIGR-U on an I-Phone or an Android phone will allow USMA to coordinate directly with the cadets through NMAA to enable near-real time network enabled C2 with the cadets as the forward-deployed soldier as a sensor. Besides demonstrating the power and flexibility that a Software Defined Cognitive Radio would have, it would be instrumental in allowing fine adjustments to the data collection in theater to fill gaps in the tactical warfighter's knowledge base. Although initially, it will simply be a data store guided by the insights of research area 2, which will identify what data is critical to support the "Build the Network" strategy, once the SDRs are employed one can easily envision a near-real time reporting to TIGR-U or TIGR if the critical security attributes for the tactical environment can be addressed.

The fourth research area would be the analysis of how PMSEII information is used to support mission planning within the workflows of the participating nations. Given the lack of a strategy to "Build the Network" of the Afghan Nation Security Force, this component could take on critical importance if we can see the similarities and differences in how this data is applied to decision making at the tactical level within the various national workflows and what insights can be gained from the various perspectives.

The over-arching policy theme will be led by California State University – San Bernardino (CSUSB). CSUSB is addressing the challenges that policy introduce when one attempts to enable Full Spectrum Dominance in a network centric environment, but addressing it from the specific use case of a deployment of TIGR-U. TIGR-U will assist with the critical warfighter capability gap of insufficient support mechanisms for gathering PMSEII information to support the Current Force. There is also a longer term strategic goal of "Building the Network" in Afghanistan. One of the grand policy challenges that can be addressed, given the rate of Moore's Law and the success of Agile Development to meet warfighter's need within the information technology arena demonstrated by DARPA programs such as CPOF and TIGR is, can DOD acquisition policy and implementation processes support the agile development paradigm that appears to be the current path to successful system creation and deployment?

- **What operational capability will be improved?**

The operational capability that will be provided is the ability providing automation assistance to commanders in executing a command decision to share information. This capability does not currently exist since information is shared on networks based upon a decades-old implementation of a policy of a "need-to-know" before granting access to information. The project defines and implements support for a commander's decision to declare a policy of a "need-to-share" a certain set of information elements.

Deliverable:

The following list of tasks/deliverables is identified for this project:

1) Prototype demonstration of moving information across a security boundary in accordance with a commander's declaration of a policy of a "need-to-share" in a valid operational HADR scenario. The result will provide a level of coalition interoperability between network nodes located in different countries. To enable this, one will also need to:

- Implement and validate the transformation engine to implement policies declared for moving data between the TIGR-U systems,

- Implement the cognitive radio ability to link the experimental environment of TIGR systems and smart phones to other, dynamically determined, communication devices, and

- Prototype the use of the technical hardware and software systems in an experiment to evaluate governance issues.

2) Transition the enabling software system to the PM for implementation within the appropriate parts of the Enterprise infrastructure.

Jointness

- **Is this a Joint project?**

This is not a Joint project.

- **If so, which Services are involved?**

Only the Army is involved initially.

- **Will the deliverable improve directly the capability of one or more Combatant Commands to operate effectively with coalition partners?**

The project will enable CENTCOM (and other COCOM) commanders in achieving mission success by providing automation assistance in executing a command decision to share information.

Requirements of International Projects *(Provide brief explanations, where required)*

Have disclosure/export control issues been addressed? _X_ Yes __ No
Explain: There is nothing to be exported here. Each nation makes there own system modifications required to achieve the desired interoperability. However, some information exchange is necessary in both directions. This information will be sensitive but unclassified unclassified (SBU).

Is an international agreement required? __ Yes _X_ No

What is the status?
N/A

What is the status of the engagement with the project's foreign partners?

The US-French effort will be a continuation of work performed by COL Kevin Huggins while at the École Nationale Supérieure de Techniques Avancées (ENSTA) in Paris, France as part of the Engineer and Scientist Exchange Program (ESEP). Dr. Omar Hammami at ENSTA enthusiastically endorses continuing the effort started during the period of the ESEP and USMA is coordinating the exchange of additional faculty and cadets to continue the current effort. In addition, COL Huggins collaborated with the Centre de recherche en informatique (CRI) at Mines ParisTech. Dr. François Irigoin, the deputy director at CRI, strongly supports the continued collaboration that has spanned several years. The center's support has included hosting US Army officers and West Point cadets for research exchanges.

The US-Afghanistan effort will be a continuation of the ongoing effort to assist the National Military Academy of Afghanistan (NMAA) to educate and train NMAA cadets. Dr. James served as a mentor to the Computer Science Department at NMAA from February to July 2009 and assisted in development of the NMAA participation in the Flowing Valued Information (FVI) project.

We have coordinated extensively with US/UK Information Technology Alliance (ITA) partners concerning technical issues and hope to involve UK units in the demonstration activities. UK participation is still being aggressively pursued and will be included if possible within UK resource constraints.

What are the benefits to the United States in pursuing this project?
The benefit to the US for pursuing this project is that it will demonstrate a critical enabling capability which has been identified by COCOMs as a shortfall in currently

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available technologies: the ability to provide automation assistance in executing a commander's decision to share information.

What are the risks to the United States in pursuing this project?
The technical barriers to successful project are considered to low level of risk. A recent technical result has established that implementation of a "need-to-share" policy will not affect existing information security policies regarding a "need to know" http://www.netscience.usma.edu/Research%20Report%201%20-%20James%20-%20December%202009.pdf .

_____

Product

_____

Is this an R&D project? **_X_ Yes** **__ No**

Define the R&D content:
The R&D content is in four areas:
1. Valuing information in accordance with its' relative contribution to meeting the intent of the commander and demonstrating a capability for flowing valued information among network nodes in accordance with a commander's declaration of a "need to share" the information,
2. Identification of explicit data to be collected in accordance with lessons learned in theater regarding the relative importance of SWEAT (sewer, water electricity, and telecommunications) working properly,
3. Exploring the use of software defined radios to enable near-real time data exchange for the Afghan cadets while they are in the field collecting information, and
4. Analysis of how PMSEII (Political, Military, Social, Economic, Information and Infrastructure) data is used to support mission planning within the workflows of the participating nations.

Describe the demonstration and testing plan for the project
The demonstration will be done by flowing sensitive but unclassified (SBU) data bi-directionally between the United States Military Academy (USMA) at West Point, New York and the National Military Academy of Afghanistan (NMAA) in Kabul, Afghanistan.

Is there a tangible outcome for this project? **_X_ Yes** **__ No**

Explain: The goal of this effort is to develop and demonstrate a short-term solution that can be delivered to the Current Force that will enable automation support for coalition commanders declarations of a "need to share" information for mission success. The sharing of information capability will include individuals and groups not normally "on the net" with other coalition partners (e.g. local government

officials and non-government agencies). This capability will be focused by creating a HADR scenario for typical on-going tactical operations in Afghanistan.

What is the estimated time frame for the Initial Operating Capability (IOC)?
An 18 month effort is planned starting 2QFY10 and concluding in 4QFy11. It is expected that an Initial Operating Capability (IOC) would be installed within 18-21 months.

Is the product of this proposal portable to other COCOMs or Services?

Explain: Any COCOMs or Services executing tactical operations with coalition partners can benefit from project results. Moreover, the solution will be readily extensible to other coalition forces that would benefit from sharing information with individuals and groups not normally "on the net" with security forces.

What is the transition aim for this project?

It will be a:

__ Program of Record

__ Fieldable Asset

__ Risk reduction for next phase of acquisition

_X_ Other: Developments will transition into PM Battle command as a component of the Battle command Common Services (BCCS) and transitioned to the field as part of PEO C3T's SWB 3 in FY12 to enhance coalition C2 data and information exchange.

What is the current technical maturity level of the system/capability?
The current technical maturity level of the system/capability is Technology Readiness Level (TRL) 4/5. The Tactical Ground Reporting (TIGR) system has been fielded to brigades deploying into Iraq and Afghanistan for the past two years. An interface to the TIGR system has been demonstrated to place multimedia into the system and take multimedia data out of the system. Initial FVI formal results have established the technical ability to implement a "need to share" capability to share information in accordance with a commander's declaration of a "need to share" while retaining security guards on information to be protected from security violations based on a "need to know".

What is the proposed technology/capability maturity level at the end of the CW project?
The proposed technology/capability maturity level at the end of the CW project will be at (TRL) 6/7 or higher.

List the project's metrics for success:
- Sharing of information across a security boundary in accordance with a declaration of a "need to share"

- Maintenance of information security for elements protected based on a "need to know"
- Latency of the newly developed capability will increase the overall latency of the combined systems by no more than 1 minute over existing benchmarked system latency.

Financial Information

Create a table (see template below) that provides the following information:

- U.S. sponsoring organization's estimated financial costs by fiscal year and program element. Indicate in a footnote if these costs have been (i.e., available for obligation), or will be, approved in the budget.
- Estimated international partner financial costs, by country and fiscal year.
- Estimated value and description of the U.S. sponsor's and other participants' (U.S. and international partner) non-financial contributions (e.g., equipment, testing facility, manpower, prior investment). For foreign non-financial contributions, use of comparable costs of in-kind contributions is acceptable, i.e., what it would cost the U.S. to provide the equivalent service, equipment, manpower, prior investment, etc., that are credited to foreign partners.

Funding Source	FY09 (if relevant)	FY10	FY11	FY12 (if relevant)	Category TOTAL
US Costs					
OUSD AT&L (CWP) PE 0603923D		$500K	$500K		$1000K
Funding Source 1 PE					
Funding Source 2 PE					
US Financial Total Costs		$500K	$500K		$1000K
Organization: Asset:	C2D $50K	C2D $50K	C2D $50K		$150K
Organization: Asset:		ARO FVI $150K	ARO FVI $150K		$300K
US Non-Financial Contributions					
US Total Contribution	$50K	$700K	$700K		$1450K
Partner Costs					
Partner Financial Costs (by country)					

Country: Asset:		France $500K	France $500K		France $1000K
Country: Asset:		Afghanistan $200K	Afghanistan $200K		Afghanistan $400K
Partner Non-Financial Contributions (by country)					
Partner Total Contribution		$700K	$700K		$1400K
Total Project Value	$50K	$1400K	$1400K		$2,850K

NOTE: As a general rule, CW financial contributions cannot exceed total foreign contributions.

Points of Contact

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Appendix 25

Email to French Universities after Summer Meetings, September 5, 2010

From: Clifford Young [mailto:cyoung@csusb.edu]
Sent: Sunday, September 05, 2010 6:38 PM
To: Kevin COL MIL USA USMA Huggins; Bill Lowery; Patrick Eparvier; Robert Willis; Philippe Larrue; Brigitte Bidegaray- Fesquet; Jean Joanna; Pierre-Jean Benghozi; Vijay P. Pcharya; Dominique Grand; Guy Saez
Cc: Crystal Escalera
Subject: Bonjour, Thank You For Meeting With Us This Summer 2010

Bonjour, I would like to express my sincere appreciation and along with my colleagues' thank you for the opportunity to meet with you in France this past July. Our meetings with you this summer were very informative, insightful, productive

and most enjoyable.

⬚

As I committed in our conversations, here is a recap of our project, a brief status report on our research efforts as well as possible "next steps" to move forward.⬚As you know, the Innovation and Policy Analysis Project at California State University San Bernardino (CSUSB) and the Network Science Center (NSC) at the United States Military Academy are working together to address the technological and policy barriers that hinder information sharing among our soldiers in the battle space as tasked by the Army Research Laboratory (ARL).⬚Our effort involves the gathering and sharing of information for both counter-insurgency and nation building, the investigation of the policy barriers that prevent the implementation of new technologies for information sharing, and the utilization of technology to implement effective information sharing efforts. The overall approach of this research is to combine innovative science technology, cognitive science and computer science research with an analysis of public policy and legislative policy to advance U.S. Army network centric operations forward.

⬚

It is our desire to expand this partnership to include coalition partners in order to develop a new technology program (i.e. software program) that would meet the information sharing needs of our soldiers in the field.

⬚

For your review, I have included below a few excerpts from our current research regarding information sharing from a U.S. Soldier perspective. We have found that the responses we have gathered to be rich with data that can further assist us in regards to information sharing among soldiers:

⬚

During the months of June thru August, our project has collected over 250 responses from U.S. Army Active, Reserve, and National Guard troops as well as Defense Department Civilians and Contractors. The participant profile is male, 39 years old, with a bachelor's degree. Additionally, a majority (40 percent) of the respondents are U.S. Army reservists while slightly less (37 percent) are U.S. Army active duty soldiers, with an average of 17 years of service in all the major branches of the U.S. Army. Furthermore, over half (55 percent) of the respondents are officers. Their deployment locations are almost evenly split between Iraq and Afghanistan (58 percent and 53 percent respectively) with numerous soldiers having multiple deployments.

In addition, a considerable majority of respondents (77 percent) stated that they could effectively share information, while a minority (9 percent) of respondents said that they had great difficulty sharing information effectively. However, most respondents said that even though they could share information, they did so after much trial and tribulation. Moreover, a majority of soldiers said that there are too many redundant systems that are not compatible with each other, causing information to be entered repetitively. Most respondents said that to improve information sharing, there would need to be only one system that everyone is trained to use so that each one can perform their job more efficiently.

After our researchers complete data entry, code open ended responses, perform

statistical analysis, and begin follow up with approximately 150 soldiers, this study will be presented at the5th Annual Network Science Workshop at The Network Science Center at the U.S. Military Academy West Point which will be held from 26-28 of October, 2010. As you know, we have two other surveys in the field, both in Afghanistan, "inching along".
⬛

As promised, I have attached our current White Paper from our project associates Bockman, Sirotnik, and Ruiz, "White Paper": An Empirical Study of Barriers to Information Sharing, "Institute of Applied Research, April 2010.We plan to have a follow up White Paper out by December.This attachment will follow in a separate email.

⬛As a next step, I propose the scheduling of a working meeting during the month of January 2011 in France to continue a further review of our research, the examination of our methodology, and to explore the possibilities of a joint effort. If you have any additional insights, suggestions, or questions, please feel free to contact us via email or phone. We welcome your expertise as we develop our next course of action.
⬛

Thank you once again for taking the time to meet with us and we look forward to meeting with you once again in January.

À bientôt,

   Clifford

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Appendix 26

Annual Program Plan FY 2010-11

Integrated Information Technology Policy Analysis Research (IITPAR)
Annual Program Plan FY 2010-11
for
Cooperative Agreement Number W911NF-08-2-0049 between the Foundation for
California State University, San Bernardino (CSUSB) and the US Army Research
Laboratory (ARL)
Period of Activity: July 1, 2010 - June 30, 2011
ARL Cooperative Agreement Manager: Mark A. Thomas
Principal Investigator: Clifford O. Young, D.P.A.
Phone: (909) 537-5717
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The US Army faces ongoing challenges in implementing Network Centric Operations, which demands continuous and rapid transition of new information technology into defense systems. At the same time, the Army must keep policy-impacting information technology security in sync with those technology advances. Classified Intelligence products provided to war fighting forces are restricted to the Secret Internet Protocol Router Network (SIPRNET) portion of the Defense Information System Network. The soldier not on the secure network, yet facing an immediate threat, needs only a small portion of the information that might give her/him heightened awareness of imminent danger, but current policy prevents the soldier from having that access. In terms of access to classified data, a tremendous gap exists between technological capability and legal and governmental doctrine. Despite recognition by the Department of Defense that providing actionable intelligence to soldiers on the battlefield is likely to improve operations and save lives, public policy and technology obstacles have delayed the military's ability to transmit situational intelligence to soldiers.

There is a need to address those public policy and technology barriers to better enable the soldier in the field to do her/his job. The goals and objectives of this research are to identify innovative science technology, cognitive science, and computer science research with an analysis of public policy issues and legislative policies to advance today's and tomorrow's US Army network centric operations and homeland security. The success of this project will be measured by the impact on the Army community and beyond with regard to proposed changes in information sharing, technology advancement, and public policy.

Task 1   Problem Definition and Detailed Plan

Advances in policy-aware, semantic web technologies have the potential to speed the flow of vital information to and from soldiers in the field, but deployment is frequently blocked by policy barriers. These barriers occur at two policy levels defined as "little p" – the operational or organizational level – and "Big P" – the public policy level. Continue to identify barriers at both levels in order to better define the problem and to seek solutions to policy barriers.

Task 2   Policy Workshops with Proceedings and Policy Working Group Quarterly Meetings with Experts in Public Policy and Technology as They Relate to Communications and Battle Space Issues

Convene two national policy and technology workshops with proceedings. Participants will include United States Military Academy's Network Science Center. Invite expert speakers and policy makers.

Task 3   Research Conference Participation

Participate in international and domestic research conferences and workshops related to the project including the US Army Research Laboratory (ARL) Cross Domain Information Exchange (CDIX) and US Army Communications-Electronics Research, Development, and Engineering Center (CERDEC) workshops.

Task 4   Research and Publications

Continue to develop the barrier survey research and research on the need of soldiers in the field, which will result in publications in policy journals and/or presentations at conferences and meetings.

Task 5   Network Science Research and Technology Development and Analysis of TIGR-U Technology Application

Work with United States Military Academy's Network Science Center to promote sustainable research in Network Science and Technology using the unclassified version of Tactical Ground Reporting system (TIGR-U) as the technology application.

Assist in the Coalition Warfare Program (CWP) through expertise in the design of surveys and in the collection, management and analysis of data gathered through the CWP. This work consists of:

- Production of a research design document that will define the goals and objectives of the research, the methodology, the purpose of the research, target population and future directions.

- Assistance in the development of survey questionnaires for use in collecting Political, Military, Economic, Social, Infrastructure and Information (PMESII) data and Humanitarian Assistance/Disaster Relief (HADR) data for the project. This consists of the surveys that will be used by National Military Academy of Afghanistan (NMAA) cadets in field.
- Responsibility for the uploading of survey results into a database analysis software, such as SPSS, and for the management and dissemination of that data to research partners.
- Analysis of data collected through CWP surveys. This will include a beta test of initial survey results and responsibility for refining future survey research based on that analysis. In addition, this data analysis will be cross analyzed with other databases resulted from surveys undertaken in Afghanistan.
- Production of tables and charts based on data analysis and dissemination of those tables and charts to research partners.
- Production of a White Paper and research reports based on the results of research undertaken through the CWP.

Task 6   MOU between IITPAR at CSUSB and Network Science Center at West Point

Establish a Memorandum of Understanding (MOU) between IITPAR at CSUSB and Network Science Center (NSC) at the United States Military Academy (USMA) at West Point for capacity building at CSUSB and to support the ongoing research at NSC.

Task 7   IHMC Technology Developments and Demonstration

Institute for Human and Machine Cognition (IHMC) will continue its technology developments and demonstration with presentations at the ARL and relevant conferences.

Task 8   Program Management

Submit quarterly status reports to ARL Cooperative Agreement Manager (CAM) on October 15, 2010; January 15, 2011; April 15, 2011; and July 15, 2011 and submit the annual report to ARL CAM on August 29, 2011. The quarterly status reports include technical and business status reports. The annual report includes disclosure of all major technical developments and progress for the preceding 12 months of effort. Conduct monthly teleconferences with ARL, USMA's Network Science Center, IHMC, CERDEC, and other participants.